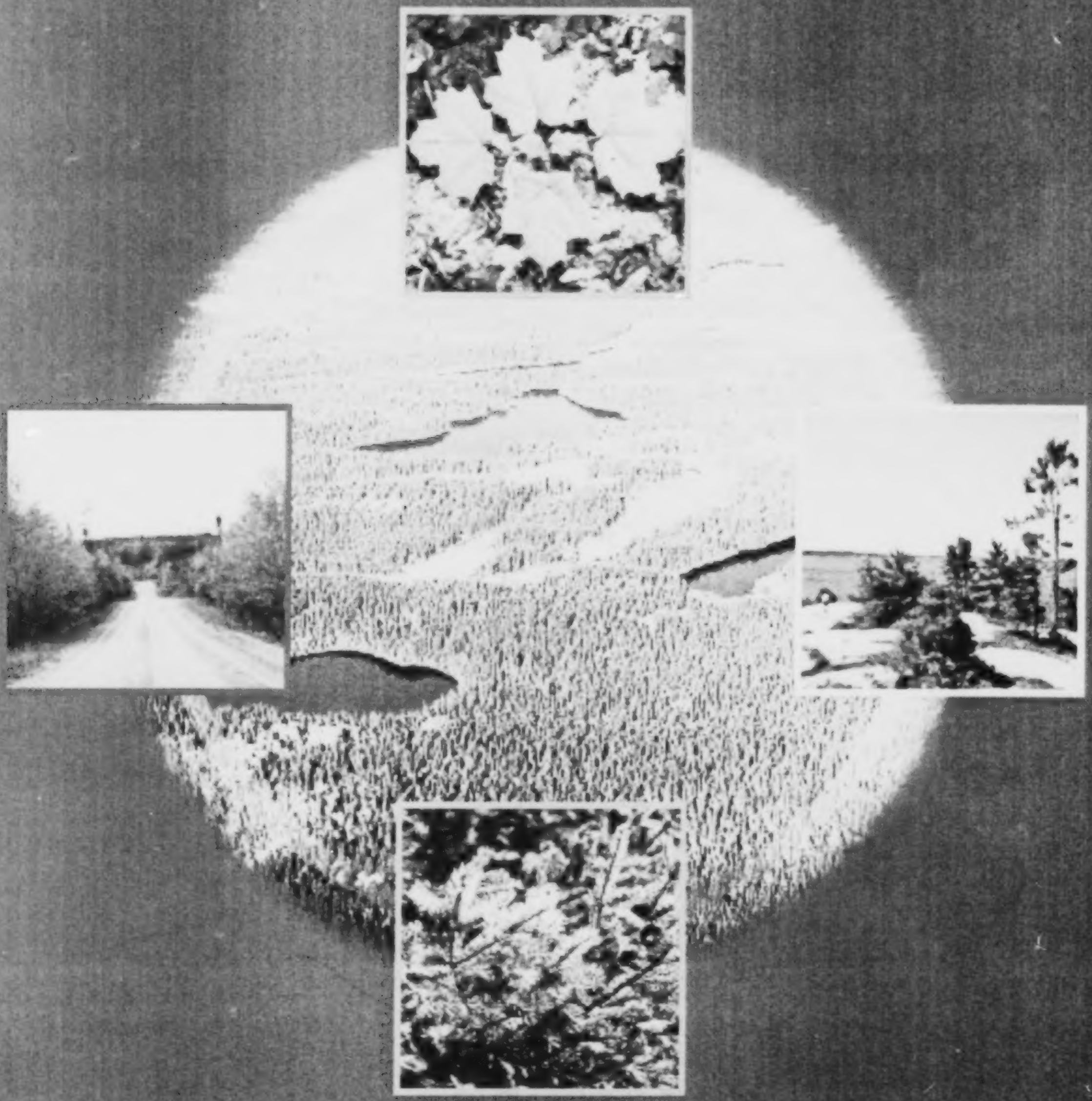
Ontario

Annual Report on Forest Management 2000/2001



FOREST INFORMATION SERIES

Annual Report on Forest Management

For the year April 1, 2000 to March 31, 2001

Ontario

Minister of Natural Resources of
the Province of Ontario

To his Honour
The Lieutenant-Governor of the
Province of Ontario

May it please your Honour

The undersigned begs respectfully to present to your Honour the Annual Report on Forest Management for the fiscal year beginning April 1, 2000 and ending March 31, 2001.

Jerry J. Ouellette
Minister

September, 2002

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Executive Summary

In 1994, the Environmental Assessment (EA) Board in Ontario issued its decision on the *Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario.*

The EA Board's decision approved the timber management process described by the Ministry of Natural Resources (MNR), with 115 binding terms and conditions. One of these conditions requires MNR to make an annual report on forest management to the provincial legislature. This is the sixth such annual report. It covers the year April 1, 2000 to March 31, 2001 but, because of the time period when data was collected, some of the information refers to 1999/00.

The forest management legislative and policy framework of MNR has been undergoing significant improvements in recent years. The *Crown Forest Sustainability Act* (CFSA), which came into effect in 1995, requires anyone operating in a Crown forest in Ontario to ensure the long term health of the forest so that all the benefits of Crown forests are available to future generations.

Ministry of Natural Resources has instituted changes affecting the responsibilities of the forest industry, the opportunities for the general public to become involved in forest management planning, the system for licencing forest companies, the fees paid to harvest wood, and the funding for forest renewal (which is now stabilized through mechanisms that provide dedicated funding for renewal).

The 107.6 million hectare area of the province of Ontario is comprised of about 88.7 million hectares of land and 18.9 million hectares of water. The productive forested land on Crown land covers about 33.6 million hectares, with 21.8 million hectares of this area eligible for forestry activities. The focus of this annual report is to provide information on the activities carried out on this 21.8 million hectares. This area is referred to as the Area of the Undertaking (AOU) in the EA Board's decision.

Announced on March 29, 1999, Ontario's Living Legacy represents a major milestone in natural heritage protection and provides a land-use strategy for an area covering 45 percent of the province of Ontario. Ontario's Living Legacy established 378 new parks and protected areas, covering 2.4 million hectares, and brings the total area of provincial parks and protected areas in Ontario to 9.5 million hectares. These parks were established to represent natural heritage features and protect the integrity of the ecosystems they encompass. The 'regulation' of the 378 parks and protected areas is a very complex process and each site requires additional local consultation to finalize the boundaries. As of April 6, 2001, 91 sites have been regulated. The combination of the area of these new parks and protected areas, existing parks, and other areas normally excluded from harvesting has reduced the total area within Ontario where forest harvest operations are allowed to occur.

The AOU is now divided into 62 management units (as of April 1, 2000). The sixty-third management unit is comprised of all the pieces of Crown land in southern Ontario outside the AOU. The CFSA requires that an approved forest management plan be in place for each management unit before any forestry operations take place. A forest management plan covers a 20-year period. It describes the values of the forest in a management unit, as well as the harvesting, renewal, and other forestry-related activities that will take place. A forest management plan is renewed every five years through a process that provides opportunities for public input. In 2000, 15 forest management plans were approved and implemented.

The *Forest Information Manual* (FIM) is one of the four regulatory manuals required by the CFSA. The FIM describes the requirements for exchanging information about the management of Crown forests between the forest industry and the MNR. The FIM was approved into regulation on April 25, 2001.

The CFSA provides for two types of licences: Forest Resource Licences and Sustainable Forest Licences. In 2000/01, there was a total of 2,491 licences in place in Ontario covering a total of about 25 million hectares of productive forest area. Some of these licences overlap one another, which artificially inflates the area of productive forest.

The figures for total harvest by area and volume used in this report are from 1999/00 because data collection on harvesting and other disturbances is not completed until late in a given year. In 1999/00, harvesting activities took place on 201,102 hectares. A total of almost 22.6 million cubic metres of wood was harvested within the AOU. Forest fires occurred on a further 65,245 hectares of productive forest.

The CFSA requires a portion of the money received from forest companies to be designated exclusively for forest renewal activities. In 2000/01, the Government of Ontario received a total of nearly $202.6 million from timber sales, of which over $97.4 million went directly to funds designated for the maintenance and renewal of the forest, and for work associated with ensuring the future of the forest. In the same period, a total of over $109.1 million was spent on forest renewal activities.

Renewal of the forest occurs both naturally and with assistance. In 2000/01, there was natural regeneration (even and uneven-aged) on 107,811 hectares of land. Assisted renewal occurred on 100,125 hectares. Site preparation activities, such as by mechanical means, use of herbicides, and prescribed burning, took place on another 76,578 hectares. In total, renewal activities were carried out on 298,479 hectares of productive forest.

Tending activities were conducted to improve the quality and growth of some areas of the forest. During 2000/01, tending activities such as thinning were carried out on 88,047 hectares of forest. There were no protection activities (e.g., aerial application of insecticides) reported for 2000/01.

Forestry operations require a complex system of primary and secondary roads, the cost of which is now borne by forest companies. In 2000/01, 608 kilometres of primary and secondary roads were constructed in Ontario forests to serve management activities. Maintenance work was carried out on another 14,917 kilometres of road.

This report discusses the efforts of MNR and First Nations communities in MNR districts to respond to Term and Condition #77 of the EA Decision, and to implement ways of achieving a more equal participation by Aboriginal peoples in the benefits derived from forest management activities.

This is the third annual report of compliance monitoring to provide results of “industry self-monitoring and reporting”. The forest industry is required to report the results of their inspections to MNR. The MNR conducts inspections to verify all instances of non-compliance reported by companies, as well as to carry out random and planned inspections of forest operations. Of the 8,441 inspections undertaken across the province, companies conducted 6,161 and 2,280 were conducted by MNR. The vast majority of the inspections reported compliant operations. A total of 159 remedial actions were required by MNR that ranged from warnings to "stop work" orders, and included administrative penalties.

All management units are audited at least once every five years. In 2000/01, Independent Forest Audits were conducted on a total of 18 management units. These included the Brightsand, Dog River-Matawin, English River, Gordon Cosens, Iroquois Falls, Kenogami, Lower Spanish, Upper Spanish, Nakina North, Ogoki, Red Lake, Smooth Rock Falls, and Wabigoon Forests. Also included were four audits of Crown and former Crown management units: Cochrane, Kapuskasing, Moose River, and Spanish River Management Units. As well, there was one audit of a former company management unit, Iroquois Falls South.

Part of MNR's monitoring responsibilities includes assessing the impacts of forestry activities on the forest ecosystem over the long term. The final chapter of this report details policies, procedures, research, and scientific studies that MNR is undertaking to ensure that the guidelines, data, methodologies, and underlying science are available to monitor and manage forest management activities effectively.

Chapter 1

Introduction

Management of Ontario's forests has evolved through past decades from managing for timber to managing for all the values of the forest. With the introduction of the *Crown Forest Sustainability Act* (CFSA) in 1995, Ontario adopted a policy of managing Crown forests according to the principles of sustainability; that is, to conserve large, healthy, diverse, and productive forests and their associated ecological processes and biological diversity. Forest management has also been guided by the *Environmental Assessment Act*. In 1988, the Environmental Assessment (EA) Board began an assessment of the Crown land timber management planning process of the Ministry of Natural Resources (MNR), which is responsible for forest management in Ontario. Six years later, after extensive public hearings, the Board released its decision on the *Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario* (EA approval or EA decision) for a large part of the province, referred to as the Area of the Undertaking (AOU). The EA Board approved MNR's planning process for Crown forests with 115 terms and conditions. One of the conditions is that MNR prepare an annual report that provides the legislature and the public with information on Ontario's Crown forests.

This document is the sixth such annual report and covers the period April 1, 2000 to March 31, 2001. However, the information on disturbances, such as harvesting, forest fires, and insects, is from 1999/00. This is because disturbed areas are mapped and inventoried in the fall in the year after the disturbances occurred, to allow time to complete the gathering of information. Therefore, the gathering of information on disturbances is completed too late in any given year for the data to be included in a report on activities during that same year. New data, information, errors or omissions noted since the last report are also addressed in this report.

For management purposes, Ontario's Crown forests are now divided into 63 management units (as of April 2000), each of which is managed according to its own 20-year forest management plan. Each plan is renewed every five years through a process established in law. This annual report includes information on the most recent harvesting and renewal activities for the forest as a whole and provides a list of forest management plans in various stages of development to be implemented in 2000 to 2003 inclusive, following their approval.

Also included is an overview of the licencing and revenue-generating system for forest management activities. This annual report also presents information about Term and Condition #77 (T & C #77) of the EA Decision by providing an update on MNR's progress on the involvement of Aboriginal communities in the benefits of forest management.

Forest management activities and their effects are monitored by MNR to ensure that forest management plans are being followed appropriately and to check on the long-term health of the forest. These monitoring systems are explained in this report.

The report concludes with an overview of the ongoing activities and future directions of MNR, as required by the EA Decision.

With this annual report, MNR is providing information that will help in understanding how Ontario's Crown forests are being managed and provides baseline information against which future forest management activities and annual reports can be compared.

Other documents are available that provide information about forest management. They include:

- the *Policy Framework for Sustainable Forests*, which lays out the principles for managing forests sustainably in Ontario
- MNR's *Statement of Environmental Values*, which sets out the environmental principles that govern MNR's management of Ontario's natural resources
- the CFSA
- the *Forest Management Planning Manual for Ontario's Crown Forests*
- the *Forest Operations and Silviculture Manual*
- the *Scaling Manual*
- the *Forest Information Manual*

- the decision of the EA Board on MNR's Class Environmental Assessment for Timber Management on Crown Lands in Ontario, which contains the reasons behind their approval of the forest management planning process and the terms and conditions that the Board set on its approval
- the *Forest Resources of Ontario 2001*, a snapshot of statistics on the state of Ontario's forests
- the *State of the Forest Report 2001*, the first such report on the state of Ontario's forest resources for the period 1995/96 to 1999/00 (as required by Appendix 22 of the EA Decision, the CFSA, and the *Forest Resource Assessment Policy*).

Chapter 2

The Forest Estate

Throughout this document, Crown land refers to land that is owned by Ontario for the people of the province and, in general, is managed by MNR. The figures provided in this chapter are from provincial inventories updated in 2001 and reflect changes put into effect by Ontario's Living Legacy (OLL) program. One of the first obvious changes is the reported total size of Ontario. Ontario has not increased in size, but the way we measure it has changed. The total landbase size being reported is 107,591,680 hectares, rather than the traditional 106,800,000 hectares reported previously. *The Forest Resources of Ontario 2001* should be consulted for a more complete description and summarization of the updated inventories.

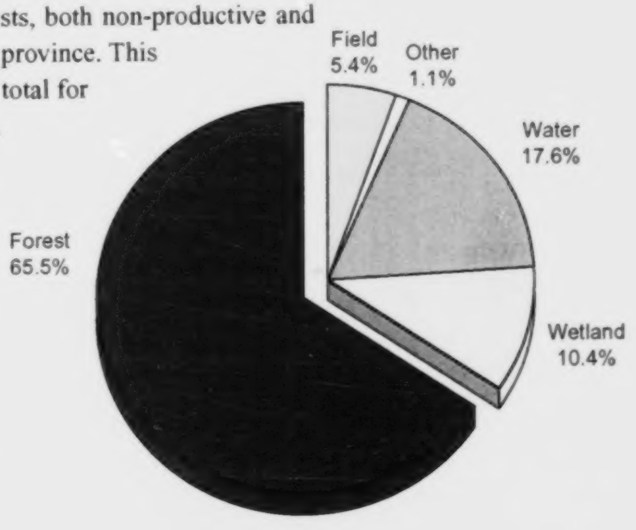
The 107.6 million hectare area of the province of Ontario is comprised of about 88.7 million hectares of land and 18.9 million hectares of water. The productive forested land on Crown land covers about 33.6 million hectares with 21.8 million hectares of this area eligible for forestry activities.

To put Ontario's forest land base into context, Figure 1 shows the broad land classes which comprise Ontario. Forests, both non-productive and productive, make up over 65 percent of the province. This is significantly higher than the comparable total for Canadian forests, which is only 42 percent.

For the purposes of this report, three major ownership groups are considered – Crown, parks, and private or other owners. Crown or publicly-owned land makes up the majority of the area at 79 percent. Parks, both provincial and national, cover an additional 8 percent, and privately-owned land and water make up the remaining 13 percent.

Figure 1

Land Classes of Ontario



Geographic Extent of Ontario

For forest management purposes, the province may be partitioned geographically depending on the context. Sub-divisions commonly referenced in this report include:

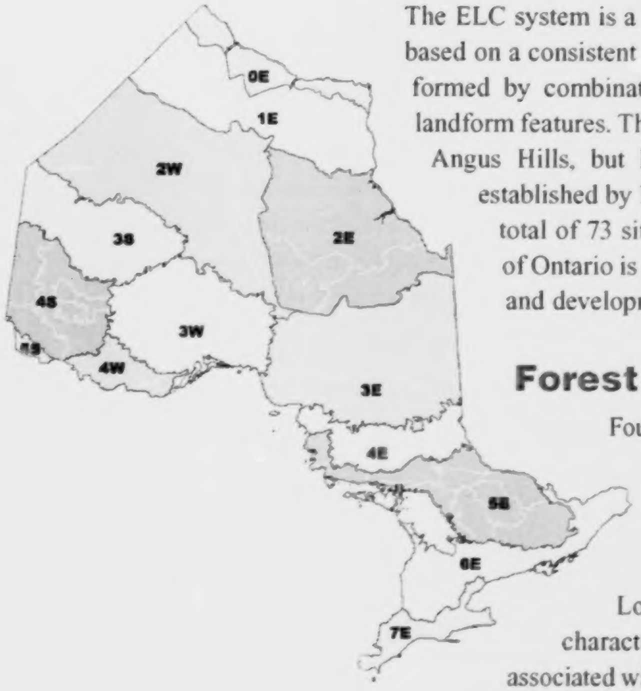
Ecological Land Classification System (ELC)
Forest Regions
Management Zones
Administrative Regions and Districts
Management Units

The Ecological Land Classification System

The ELC system is a hierarchical approach to classifying land which is based on a consistent framework of landscape and site-level ecosystems formed by combinations of geologic, climatic, vegetative, soil, and landform features. The ELC system is based on the concepts outlined by Angus Hills, but has been modified to meet a set of principals established by MNR. Each site region is further subdivided into a total of 73 site districts. A map showing the ecological regions of Ontario is shown in Figure 2. For further details about the use and development of the ELC, see Chapter 10.

Figure 2

Ecological Regions of Ontario



Forest Regions of Ontario

Four major forest regions are represented in Ontario: the Deciduous Forest region in southern Ontario, the Great Lakes-St. Lawrence Forest region in southern and central Ontario, the Boreal Forest region in northern Ontario, and the Hudson Bay Lowlands in the far north. Each forest region is characterized by its climate, forest ecosystems, and associated wildlife species. North-south gradients in temperature and east-west gradients in precipitation largely determine the extent of these forest regions. Over 97 percent of Ontario's population lives within the Great Lakes-St. Lawrence and Deciduous Forest regions.

Broad zones of natural transition occur between forest regions. As a result, certain tree species may appear in unexpected forest regions; for example, the occurrence of maple or white pine in the Boreal Forest. A map of the forest regions of Ontario is shown in Figure 3.

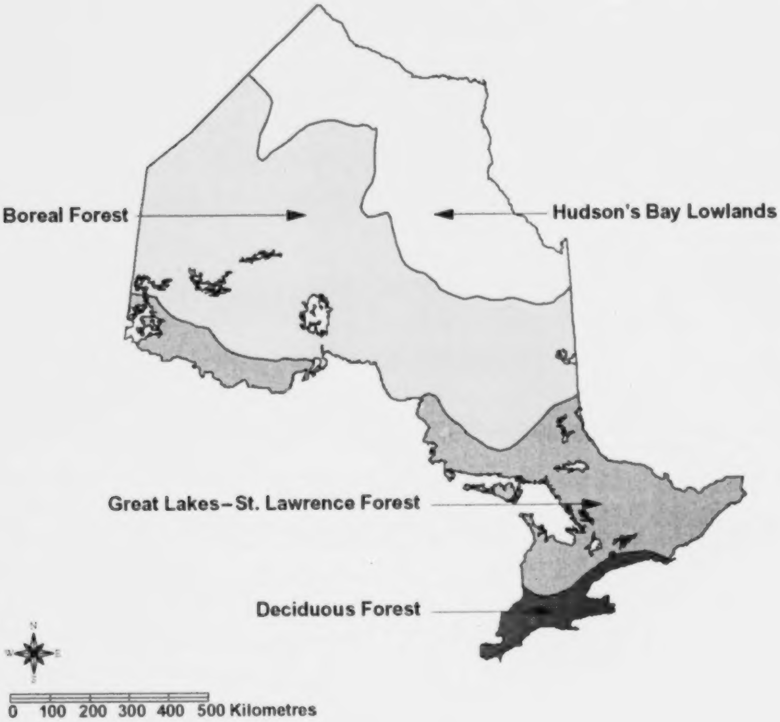

Boreal Forest
Hudson's Bay Lowlands
Great Lakes-St. Lawrence Forest
Deciduous Forest
N
W
E
S
0 100 200 300 400 500 Kilometres

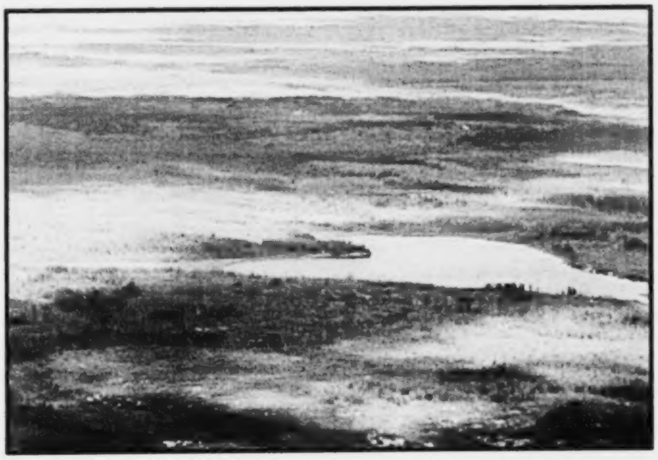
Figure 3

Forest Regions of Ontario

The Hudson Bay Lowlands is a large, low-relief expanse of wetland, one of the largest in the world. With an area of 25.7 million hectares, it is comprised of both treed and open muskeg (74 percent), dotted with thousands of small lakes and ponds. Forest cover is less than 17 percent and is generally stunted tamarack and black spruce growing along riverbanks and other well-drained areas. The Hudson Bay Lowlands support a great variety of birds and animals, such as polar bears, geese, and other animals normally associated with Arctic habitats. The Hudson Bay Lowlands are greatly affected by the cold northern climate, and contain all of Ontario's tundra. The region also contains Ontario's largest park, Polar Bear Provincial Park, which is 2.3 million hectares in size. Figure 4 shows an aerial view of an area typical of the Hudson Bay Lowlands.

Figure 4

An Area Typical of The Hudson Bay Lowlands

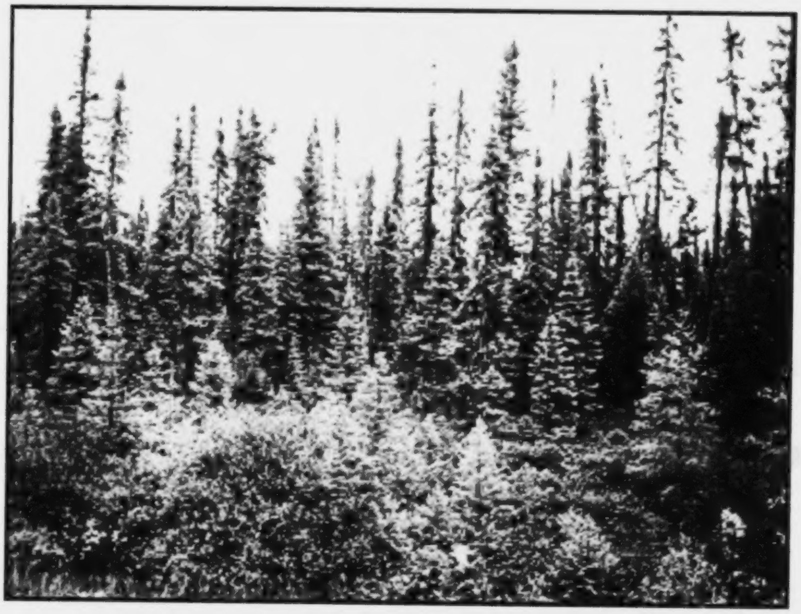


The Boreal Forest is a world-wide band of conifer-dominated forest that stretches across

Scandinavia, Russia, Alaska, and northern Canada. In Ontario, the Boreal Forest region extends from the northern limits of the Great Lakes-St. Lawrence Forest to the Hudson Bay Lowlands. With an area of 49.8 million hectares, this forest region is by far the largest in the province. Boreal tree species are often associated with particular soil types and terrain conditions. For example, black spruce and larch (tamarack) are often associated with poorly-drained areas, while trembling aspen, white birch, and jack pine grow on well-drained sites. The boreal softwoods (jack pine, black spruce, white spruce, and balsam fir) and intolerant hardwoods (trembling aspen, white birch, and balsam poplar) are generally even-aged in character. Black spruce makes up 50 percent of all tree species in the Boreal Forest by growing stock volume. Boreal forests are characterized by natural disturbance, and are heavily influenced by the size, intensity, and frequency of fires that have burned across the landscape. Winds also affect forest conditions by blowing trees down, and insects can defoliate large areas of forest. During the last 80 years, timber harvesting and forest fire suppression have affected the tree species mix and age class structure of the Boreal Forest. Figure 5 shows a typical black spruce forest found in the Boreal Forest.

Figure 5

A Typical Black Spruce Forest Found in the Boreal Forest



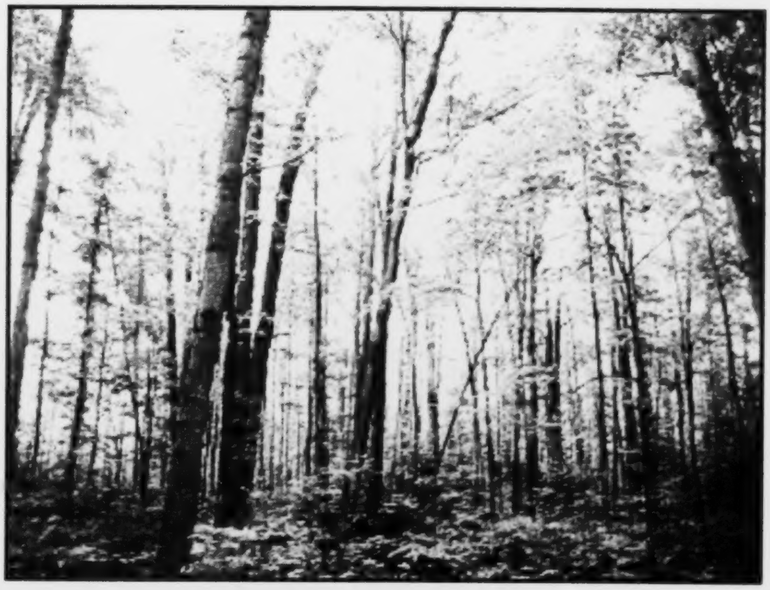


Figure 6

A Typical Maple Forest Found in the Great Lakes-St. Lawrence Forest

The Great Lakes-St. Lawrence Forest region extends inland from the edges of the Great Lakes and the St. Lawrence River in central and southern Ontario. The greatest concentrations of these forests occur on the north shore of Lake Huron and in the Algonquin Park area, and in the Great Lakes - Boreal transitional zone that stretches from Thunder Bay to Fort Frances in northwestern Ontario. This forest region represents 20 percent of Ontario's actively managed Crown forests. Parts of this forest region have thin soils over granite bedrock; other areas have deep, well-drained soils. Trees that dominate the Great Lakes-St. Lawrence Forest include sugar maple, white pine, red pine, eastern white cedar, hemlock, tamarack or larch, black spruce, white spruce, red oak, white oak, basswood, ash, poplar, yellow birch, and white birch. The great diversity of habitat in this region supports many wildlife species. Figure 6 shows a typical maple forest found in the Great Lakes-St. Lawrence Forest.

The Deciduous Forest is found in the southernmost part of the province and is the only occurrence of this type of forest in Canada. Occurring primarily in pockets of forest on private land, and within provincial parks on the north shore of Lake Erie, the Deciduous or Carolinian Forest region exists in the most densely populated area of Ontario. Although it covers less than 1 percent of Canada's land mass, the region is now home to more than 25 percent of Canada's population. Although this forest region covers over 3 million hectares, less than 15 percent is forest. More than 75 percent of this region is agricultural land, while most of the remaining area is urban. Forests are now mostly restricted to areas with low agricultural potential, such as sand plains and bottomlands. These forest fragments have been greatly modified by human activities. Good examples of Deciduous Forest exist on Lake Erie's northern shore, in parks such as Wheatley, Rondeau, and Turkey Point. Surficial deposits ranging from gravel to clay cover the limestone that underlies this region. Tree species such as maple, sassafras, walnut, and several varieties of oaks grow here. The Deciduous Forest generally

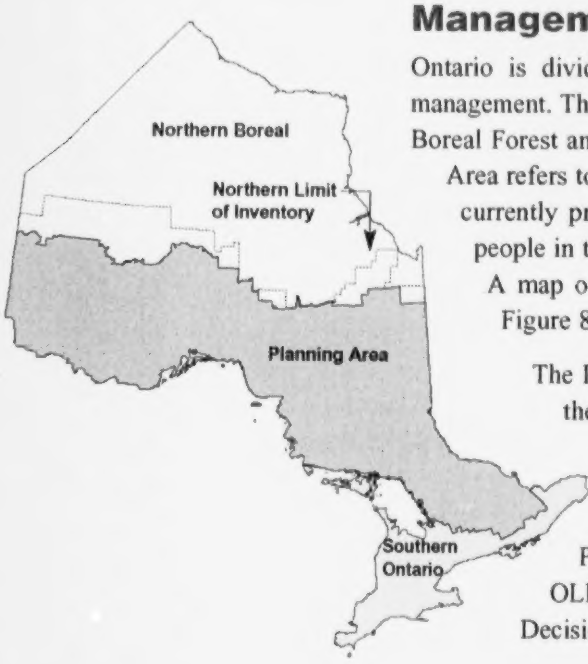
Figure 7

A Multi-species Hardwood Forest Typical of the Deciduous Forest

has the greatest diversity of tree species, while at the same time having the lowest proportion of forest. Also, with its rich forests and warm climate, several unique wildlife species such as opossum and red-bellied woodpecker occur here. Figure 7 shows a multi-species hardwood forest typical of the Deciduous Forest.

Figure 8

Management Zones of Ontario



Management Zones of Ontario

Ontario is divided into three main zones for the context of forest management. The Northern Boreal Forest describes the large expanse of Boreal Forest and Hudson Bay Lowlands in the far north; the Planning Area refers to the middle zone where forest management planning is currently practiced; and Southern Ontario is the area where most people in the province live and with which they are most familiar. A map of the three management zones of Ontario is shown in Figure 8.

The Planning Area referenced in this document is essentially the same as that area identified in the *Ontario's Living Legacy – Land Use Strategy*. There has been a slight revision to this area, which now includes the remaining 135,000 hectares of Wabakimi Provincial Park. The context for this area was defined during the OLL process, essentially starting with the AOU from the EA Decision and adding the six large parks bordering this area.

These parks are Woodland Caribou, Wabakimi, Quetico, and Lake Superior Provincial Parks, Pukaskwa National Park, and Michipicoten Island. They added an additional 2.1 million hectares to the 44.2 million hectare area of the AOU.

The regulation process for the proposed parks and conservation reserves in the OLL project will occur over the next four years. Part of this process will involve resizing individual parks as boundaries are refined and negotiated. Subtle increases and decreases will occur as part of the regulation process, with the end objective still being 12 percent or more of the Planning Area in parks and protected areas.

Administrative Regions and Districts

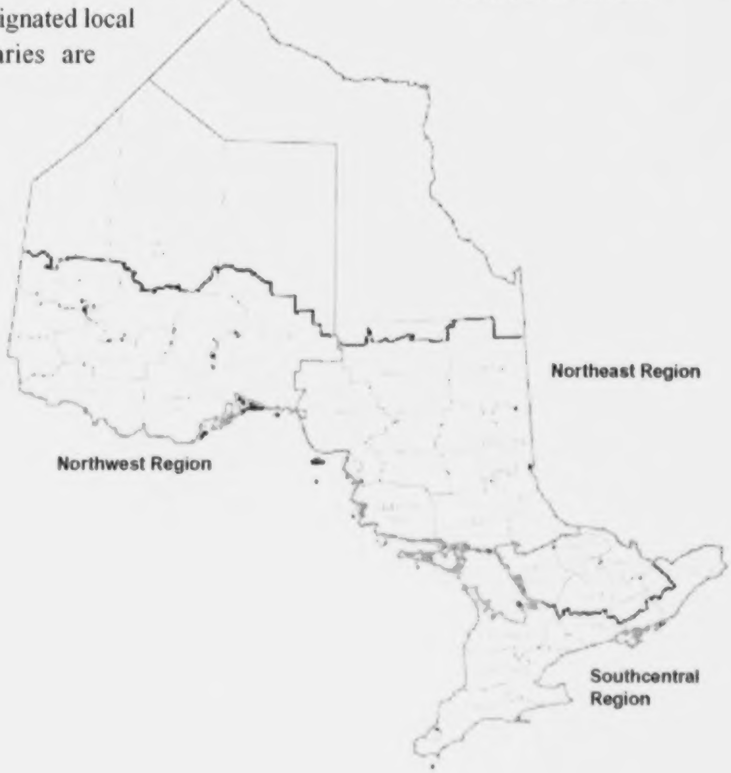
For administrative purposes, the province is divided by regional boundaries into three regions, each with a regional office: Northwest Region (Thunder Bay), Northeast Region (Timmins/South Porcupine), and Southcentral Region (Peterborough). The regions are subdivided by district boundaries. The 26 administrative districts each have a designated local office. These administrative boundaries are shown in Figure 9.

Management Units

Ministry of Natural Resources Regional Directors approve forest management plans developed for management units based on direction in the *Forest Management Planning Manual*. For a more complete explanation and listing of the management units in Ontario, see Chapter 3. As well, a map of the management units in effect as of April 1, 2000 is provided in Appendix 1.

Figure 9

Administrative Regions and Districts in Ontario

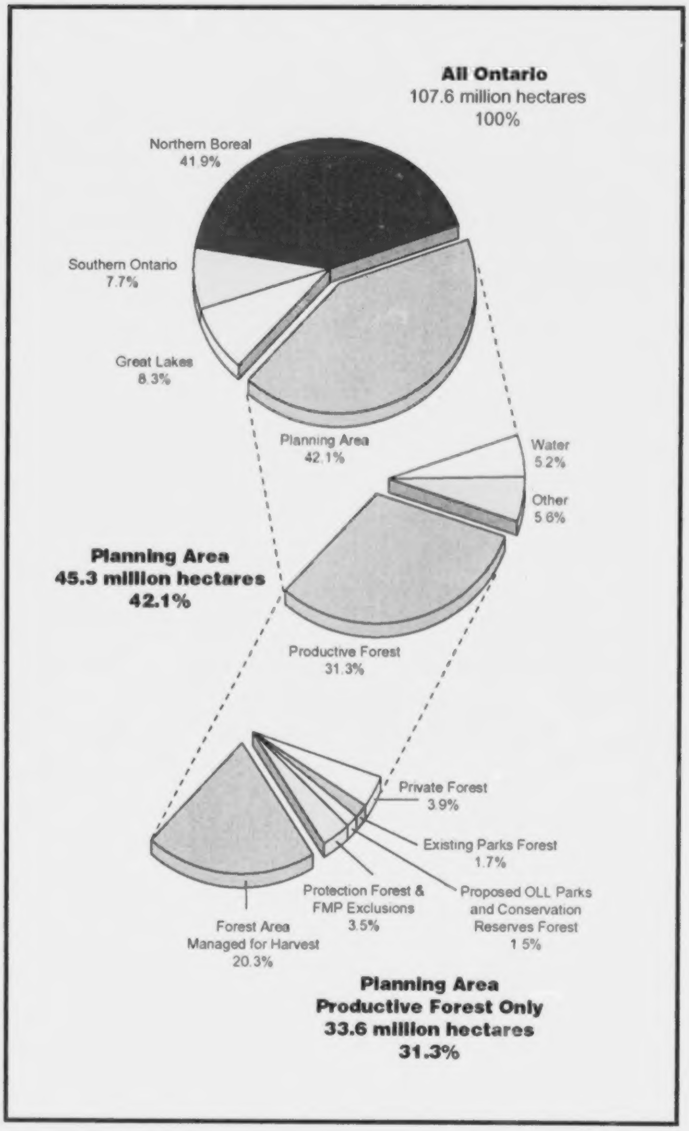


Extent of Forest Operations in Ontario

In 2001, Ontario was comprised of 107.6 million hectares of land and water as illustrated in Figure 10. The area identified as Northern Boreal (41.9 percent of Ontario) in Figure 10 describes the large expanse of Boreal Forest and Hudson's Bay Lowlands in the far north. The Planning Area (42.1 percent of Ontario) refers to the middle zone where forest management is currently practiced. Within the Planning Area, normal harvest operations are limited to 20.3 percent of Ontario. Southern Ontario (7.7 percent of Ontario) is the area where most people in the province live and is predominantly private land.

Figure 10

Extent of the Planning Area for 2001



Ontario's Forest Inventory

For this annual report, the area of the province has been summarized using both Ontario Land Cover data and Forest Resources Inventory (FRI) data. These summaries are shown in Appendix 2 using a common set of land classes for the province as a whole and two sub-categories of the whole province; the Planning Area and the inventoried area.

Ontario Land Cover Database

The Ontario Land Cover Database is the first land cover classification in Canada to be completed for an entire province wholly from satellite remote sensing data. The Ontario Land Cover data was derived from digital, multispectral LANDSAT Thematic Mapper (TM) data recorded on a range of dates between 1986 and 1997, but the majority of the satellite data frames were recorded in the early 1990s. The forest cutovers and burns were updated from 1996 TM coverage for the Great Lakes-St. Lawrence Forest region and most of the Boreal Forest region. The total provincial area summarized using this coverage is shown in Appendix 2.

Forest Resources Inventory

Using aerial photographs and field verification, MNR creates the FRI by classifying forest stands and other areas into broad physical categories including productive forest, non-productive forest, non-forested land, and bodies of water. Each component is further classified by its ownership and land use. The FRI provides descriptive information in the form of interpreted aerial photographs, forest stand maps, and computerized data. This baseline information is used for management planning and for monitoring the health of the forest.

A new inventory is required to be conducted on each management unit approximately every 20 years, and must be updated at the start of each new forest management plan to reflect all changes to the forest (i.e., depletions and accruals) that occurred prior to the commencement of the new plan. Depletions include harvest and natural reductions, such as those caused by wildfire, insects, disease, and blowdowns. Accruals include the results of forest renewal and tending activities for both assisted and naturally regenerated areas.

Currently, FRI updates occur only within the Planning Area for use in forest management plans. The average age of the FRI within the Planning Area is approximately seven years. The inventories of southern Ontario and the extreme north are now more than 20 years old. A vast area of the extreme north has not been inventoried. For comparison purposes, an FRI summary for the Planning Area and the inventoried area are included in Appendix 2.

Ontario's Living Legacy

Announced on March 29, 1999, OLL represents a major milestone in natural heritage protection and provides a land-use strategy for an area covering 45 percent of the province of Ontario. It made a commitment to the resource-based industries by providing greater long-term security to forestry and mining opportunities. It also committed to greater opportunities for outdoor recreational activities and it committed to the resource-based tourism industry by recognizing the need for certainty in their future.

Ontario's Living Legacy was the result of a massive public consultation process, called Lands for Life, launched by the MNR in 1997. The goals of that consultation were to:

a) complete Ontario's system of parks and protected areas;

b) recognize the land-use needs of the resource-based tourism industry;

c) provide forest, mining, and other resource-based industries with greater certainty of land and resource use;

d) enhance angling, hunting, and other Crown land recreation opportunities.

Implementation of the commitments made in OLL began soon after the announcement of this unprecedented land-use planning exercise.

New Parks and Protected Areas

Ontario's Living Legacy established 378 new parks and protected areas, covering 2.4 million hectares, and brings the total area of provincial parks and protected areas in Ontario to 9.5 million hectares. These parks were established to represent natural heritage features and to protect the integrity of the ecosystems they encompass. The 'regulation' of the 378 parks and protected areas is a very complex process and each site requires additional local consultation to finalize the boundaries. As of April 6, 2001, 91 sites have been regulated.

The Ontario Forest Accord

The Ontario Forest Accord was signed in March 1999. It was an unprecedented agreement among the environmental community, represented by the Partnership for Public Lands (a joint effort of the World Wildlife Fund Canada, the Federation of Ontario Naturalists, and the Wildlands League), the forest industry, and the MNR.

Through the Accord and its 31 Articles, the parties recognized the need for sustainability of the natural heritage of Ontario and the sustainability of northern communities and the forest industry that provides economic development and jobs.

The task of guiding the collaborative implementation of the Accord was given to a tripartite body called the Ontario Forest Accord Advisory

Board (OFAAB). The Minister of Natural Resources asked the signatories to the Accord to act as members of the Board.

The OFAAB was given the task of guiding implementation of the Accord by developing new tools, processes, and principles to turn the 31 commitments in the Accord into actions.

In March 2001, the Board reported on their progress in their interim report *State of the Ontario Forest Accord*. Highlights are:

- agreement reached on a set of principles (now referred to as "Room to Grow" policy framework) to direct the sharing of any new wood volumes between new industrial use and new protected areas
- progress noted on the success of mitigation measures to offset losses in industrial supply experienced by industry as a result of the new protected areas established through OLL
- progress reported on the regulation of new parks and protected areas
- identification of outstanding gaps in natural heritage representation
- progress toward the consolidation and streamlining of the forest management guidelines, in cooperation with the Provincial Forest Technical Committee
- progress towards orderly development in the far north through the MNR's Northern Boreal Initiative.

In March 2001, the Board began dialogue sessions throughout the province with stakeholders on the sharing principle for Room to Grow, mitigation measures, security of supply, intensive forest management (now enhanced forest productivity), guideline review, and other issues.

Private Woodlands

Private and federally-owned woodlands, at 6.8 million hectares of productive forest area, comprise 17 percent of the inventoried productive forest area in Ontario. About 4.5 million hectares are located within the Planning Area, with the remaining 2.3 million hectares in southern Ontario. In the southwestern portion of the province, private woodlands represent in excess of 95 percent of the total area of woodlands and, consequently, take on a special ecological and economic significance. It is estimated that approximately 20 percent of the volumes harvested annually in Ontario come from private land.

The MNR's commitment to healthy forest ecosystems extends to these private forests, although it does not have the same direct stewardship responsibility as for Crown forests. The *Private Woodlands Strategy 1991* outlines how MNR will seek to influence the sustainable management of the province's private woodlands through:

- coordinating the programs and efforts of the many agencies and groups interested in promoting stewardship
- providing education and skills training opportunities for landowners to become more knowledgeable about stewardship
- providing effective policies as incentives to foster stewardship of woodlands
- providing legislative support through the *Forestry Act*.

In 2000/01 MNR continued to implement the Ontario Stewardship Program which started in 1995/96. Led by MNR's Provincial Stewardship Coordinator and 33 local Stewardship Coordinators, 39 community stewardship councils consisting of landowners, interest groups, associations, and resource management agencies are working together to meet collective community-based stewardship goals. There are about 600 councillors, all of whom are well connected with local land- and resource-based organizations. This program provides a forum for:

1. determining and expressing local needs and concerns,
2. improving coordination of resource agency resources and program delivery,
3. enhancing access to information and educational opportunities, and
4. enhancing partnerships, teamwork, respect, and understanding between landowners and those with an interest in the land and its environmental, social, and economic benefits.

In 2000/01 the MNR provided the basic salary and support funding for the 33 Stewardship Coordinators, and distributed grants totaling $641,000 to the local councils to assist them in leveraging additional funds ($12.4 million direct financial contributions, and $6 million in-kind contributions) to carry out local projects. This support encouraged 579 projects that reflect the priority for action set by each council. Projects ranged from conducting workshops on sustainable practices for landowners; youth education initiatives such as Envirothon; marketing and certification of forest products; strategic action plans for watersheds; and fish and wildlife and wetland restoration or enhancement. Of the 579 stewardship projects, 217 were directly related to forestry. Through the efforts of 18 of the councils, 2,423 landowners participated in woodlot conferences, community forest programs, and native species workshops, and 342,300 trees were planted.

To support and supplement local stewardship councils, a number of provincial-level stewardship projects were undertaken. In partnership with many other resource agencies, Ontario Stewardship participated in the "Survey of Farmers, Ranchers and Rural Landowners – Attitudes and Behaviours Regarding Land Stewardship" carried out by Environics Research Group (September, 2000). The results of this survey were presented to a national audience at the first National Stewardship Conference held in Guelph. The results of this survey will be useful to guide future activities, and to ensure coordination amongst the various partners.

In recognition of the importance of maintaining private woodlands for public benefits, MNR designed and implemented the Managed Forest Tax Incentive Program (MFTIP) in 1997 for implementation in the1998 tax year. The MFTIP was introduced to bring greater fairness to the property tax system by valuing forest land according to its current use. This was part of the government's broader property tax reform initiative. The Ontario Woodlot Association and the Ontario Forestry Association are partners in the delivery of this program and handle most of the public inquiries and program administration. The MFTIP is designed to encourage landowner participation in natural resource stewardship on private forest land in Ontario. This voluntary program is available to landowners who own four hectares or more of forest land, and who agree to prepare and follow a Managed Forest Plan for their property. Over 200 independent Managed Forest Plan Approvers are available to assist the landowner during the preparation of the plan, while providing public accountability assurances.

In 2000/01 the MFTIP included 9,356 properties with 626,183 hectares of land. Under the program, participating landowners have their property reassessed and classified as Managed Forest and taxed at 25 percent of the municipal tax rate set for residential properties. Participants in the program range from landowners in Essex-Kent looking after their fragmented natural landscape to large forest companies in northern Ontario contributing to our northern economy.

Ministry of Natural Resources continues to support the sustainable management of private woodlands through the provision of science and information. *A Silvicultural Guide to Managing Southern Ontario Forests* was released in 2000, and provides a comprehensive overview on how best to sustain woodland values at both the stand and landscape level. Over 400 copies of this guide were distributed to forest managers within MNR, conservation authorities, and local municipalities. Special training sessions were offered in support of the guide.

Chapter 3

Forest Management Planning

Ontario's advanced forest management planning system is incorporated into the Forest Management Planning Manual for Ontario's Crown Forests (1996). This planning system includes requirements for plan preparation, implementation, monitoring and reporting.

In 1995, the CFSA came into effect. The CFSA mandates that Crown forests in the province must be managed to ensure they remain large, healthy, diverse, and productive. Since the CFSA became law, MNR has actively implemented this legislation, including the requirements for forest management planning and associated public consultation.

Forest management planning requirements established under the CFSA and the *Environmental Assessment Act*, are included in the *Forest Management Planning Manual*. This manual provides detailed planning requirements that direct how forest planning is to be carried out, implemented, monitored, reported, and evaluated. The preparation of a plan normally takes about two-and-a-half years.

Forest management plans are prepared for a planning area known as a management unit. In recent years, rationalization of management unit boundaries has been undertaken to realize forest planning efficiencies and plan implementation. As of April 1, 2000, Ontario's Crown forests were divided into 63 management units, five less than the 68 management units in place as of April 1, 1999. Further reductions in the number of management units are expected to occur each year for several more years.

Appendix 1 contains a map of Ontario showing the location of the management units. Also included is a list that identifies each management unit and indicates who has the lead for forest management planning responsibility.

An approved forest management plan must be in place before any forest operations are undertaken on a management unit. Each plan includes:

- an environmental, social, and economic description of the management unit

- long-term strategic direction including objectives and targets, an assessment of sustainability, the determination of areas eligible for operations during the 20-year period of the plan, and the planning of primary access corridors for the 20-year period
- areas of operations including harvest, renewal and tending and associated operational prescriptions for the first 5-year term
- prescriptions for the protection of values, in or adjacent to areas of operations, such as fish habitat, wildlife habitat, archaeological sites and tourism facilities
- primary and secondary access road locations for the first 5-year term
- a description of the program for monitoring forest management operations, and assessing renewal success
- supplementary documentation and a forest management plan summary

MNR monitors plan implementation for each management unit to ensure that the plan is followed. At the end of each year and also at the end of each 5-year term, reports on plan implementation are prepared. About half way through the 5-year term, preparation of a new plan begins.

Appendix 3 provides a list of all forest management plans approved for implementation in 2000. Appendix 3 also provides, in accordance with the requirements of the EA Decision for an annual report, the schedule of forest management plans being prepared for implementation in 2001, 2002, and 2003 as prepared in January 2001.

The Forest Information Manual

The *Forest Information Manual* (FIM) is the last of four regulatory manuals required by the CFSA to be prepared and implemented. The FIM describes the requirements for exchanging information about the management of Crown forests between the forest industry and the MNR. The FIM was approved into regulation on April 25, 2001.

The FIM identifies the requirements and standards for the provision of information such as:

- Forest Resources Inventory
- maps
- annual reports
- values

- silvilcutural effectiveness monitoring
- forest operations prescriptions
- forest compliance inspections
- geographic base data (water/lakes and rivers, ownership and land tenure, parks and reserves, transportation routes/roads, designated management units, etc.)

These information products are required to support the purposes of forest management planning as outlined in the *Forest Management Planning Manual*. The FIM also sets out the direction for copyright and ownership of information prescribed by the manual which is consistent with existing legislation respecting copyright, intellectual property, and access to information. The FIM maintains the MNR's ability to ensure that the public is provided with access to information about the management of Ontario's Crown forests.

The FIM focuses on the need for exchanging digital information (data in its raw form). This is a considerable challenge given that both the forest industry and MNR maintain and utilize different information systems and database structures, and organize their information and data in different ways. Therefore, one of the objectives of the FIM is to improve the exchange of quality information in a consistent and standardized form. Given this challenge, the exchange of standardized digital information will require a period of transition in order to synchronize forest industry and government information systems. The exchange of information between MNR and the forest industry has improved considerably since the regulation of the FIM.

The Forest Management Planning Improvement Project

The Forest Management Planning Improvement Project (FMPIP) was initiated in January 1999 to support an independent and open review of forest management planning in Ontario.

The focus of the review was:

a) to prepare for the review of MNR's EA Decision, which expires in 2003;

b) to address Item #15 of the Ontario Forest Accord, "to obtain appropriate modifications to the Timber Class E.A. and the Crown Forest Sustainability Act and its regulations in order to permit intensive forest management practices and the lengthening of the term of forest management plans";

c) to recommend efficiencies in forest management planning to reduce workload and documentation;

d) to identify where further interpretation and clarification of current requirements is necessary.

A steering committee and a project team were established and a project plan was prepared early in the process. The following paragraphs outline the components of the project completed during fiscal 2000/2001.

The Forest Management Planning Improvement Project solicited input from the public and practitioners through a series of workshops and a questionnaire involving Local Citizens' Committees (LCCs) and other interested parties. In addition, workshops involving planning specialists and practitioners from both MNR and the forest industry were held in several locations.

Task teams, comprised of project team members and designates from all of the organizations represented on the project team, reviewed the comments and developed issue statements, preliminary recommendations, and options. The task teams then presented their recommendations and options to the Steering Committee who reviewed preliminary recommendations and options. The Steering Committee produced the final list of recommendations.

The results were presented in a draft document. There were some subject areas the steering committee could not draw to conclusion and recommended focus groups with knowledge in these areas be formed to expand upon the recommendation.

The Timber EA Renewal Project

The approval under the *Environmental Assessment Act* has an effective period of nine years (1994 to 2003). Under T & C #114, MNR is required to carry out a comprehensive review of the forest management activities covered by the EA Approval and submit a report containing its findings, including recommendations for amending and extending the approval.

The MNR initiated the process required for preparing the EA renewal during the latter part of 2000/01 by beginning work on a project plan to guide the EA renewal effort.

Chapter 4

Forest Users and Government Revenue

Ontario's Crown forests provide the forest resources for a diverse number of forest-based industries, including lumber, structural board, pulp, paper, and newsprint. Crown forests also provide opportunities for tourism, recreation, trapping, hunting, fishing, and food production. In addition, service industries and facilities that support forest activities also depend on Crown forests.

The value of sales for Ontario's forest products sector topped $15.8 billion in 1999, a 4.1 percent increase over 1998. Table 1 shows the value of sales (shipments) in this sector for the five-year period ending in 1999.

Table 1

Ontario Forest Products Sector Sales ($millions)

Year	Value of Shipments
1995	14,526
1996	14,348
1997	14,728
1998	15,225
1999	15,849

Source: Statistics Canada 1999

Value added, the amount that the industry actually contributes to the province's gross provincial product (this eliminates the double counting effect of sales between the forest product manufacturers and their suppliers, rose to $6.7 billion, an increase of 3.8 percent from the year before. Table 2 shows the value added for the logging industry and both major forest sector industries; the wood product industries, and the paper and allied industries. Employment within the forest industry in 1999 was 249,000*. Included in this figure are direct, indirect, and induced jobs. Statistics Canada 2000 figures are not yet available.

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* StatsCan and MNR Socio-Economic Impact Model (SEIM)

Table 2

Distribution of Manufacturing Activities by Sector and Direct Employment Within Each Sector

	No. of Establishments		No. of Employees		Total Value Added	
Sector	Number	% of Canadian Total	Number	% of Canadian Total	Value Added ($ millions)	% of Canadian Total
Logging	1,657	17	6,455	14	553	12
Wood Product Manufacturing	475	22	25,633	18	2,134	17
Paper Manufacturing	289	44	34,085	33	4,014	29
TOTAL	**2,421**	**20**	**66,173**	**22**	**6,701**	**22**

Source: Statistics Canada 1999

Based on the most recent Statistics Canada census (1996), 50 Ontario communities, mostly located in northern Ontario, had at least 20 percent of their labour force employed in the forest industry. Appendix 4 lists these Ontario communities, shows the total labour force for each community, and identifies the percentage that worked in the forest sector.

As well as being a major employer, the forest industry annually invests in capital improvements and mill expansions. In 1999, the forest industry had capital and repair expenditures of $1.3 billion.

The Forest Products Industry

The forest products industry is comprised of the logging industry, the wood products manufacturing industries, the paper manufacturing industries, and other related industries. The logging industry is made up of both large and small contractors, as well as large, mill-owned operations. The contractors may work independently or directly for company-owned mills.

The wood products manufacturing industries include businesses such as sawmills, veneer mills, and structural board and lumber plants producing construction materials and specialty wood products. The capital investments in these mills range from a few thousand dollars to over $200 million.

Pulp and paper mills are the largest types of plants for converting timber fibre to forest products. A greenfield pulp mill can cost close to $1 billion.

Their output represents almost 60 percent of the value of all forest product shipments.

Table 2 shows the distribution of various manufacturing activities by sector and the direct employment within each sector in 1999/00.

The Licensing System

The majority of Ontario's forests are harvested by companies or individual operators that hold one of two types of licences: Forest Resource Licences (FRLs) and Sustainable Forest Licences (SFLs). The total land under both licence types is shown in Table 3. Although Chapter 2 refers to 21.8 million hectares where forest management activities take place, many FRLs and most salvage licences are issued on existing SFLs, which artificially inflates the area of productive forest.

Table 3

Crown Productive Forest Area Under Licence in 2000/01 by Licence Type

Licence Type	Number of Licences	Productive Forest Area (hectares)
FRL < 300 hectares	2,206	87,940
FRL > 300 hectares	198	91,626
FRL Salvage	36	23,463
SFL	51	24,753,730
Total	**2,491**	**24,956,759**

Forest Management Responsibilities in Ontario

An SFL requires the licensee to prepare forest management plans following the direction of the *Forest Management Planning Manual*. The licensee is responsible for implementing forest management plans by carrying out access, harvest, renewal, and maintenance activities. The SFL holder must follow the rules and guidelines set by MNR to ensure forests are managed sustainably.

Forest Resource Licence holders follow forest management plans approved by MNR and must operate in a way that ensures the long-term health of the forest.

Ontario's Stumpage System

In 2000/01, the Government of Ontario received direct payments from the forest industry in the form of stumpage payments, and indirect payments from taxes.

Forest companies pay a stumpage fee to the Crown for every cubic metre of timber harvested. A market-based pricing system is used by MNR to calculate the stumpage fees that companies and individuals pay for harvesting timber from Crown land. In times of strong market prices for forest products, the stumpage system triggers higher fees. In poor markets, harvesters pay lower fees.

The Crown's stumpage fees are composed of three Crown charges:

- A minimum charge per cubic metre of harvested timber, regardless of species harvested, goes to the Consolidated Revenue Fund of the province. This charge is adjusted annually. The minimum charge was raised by $1.34 from $1.50 to $2.84 per cubic metre on April 1, 1997, and was raised by $0.01 per cubic metre harvested to $2.85 on April 1, 1998. On April 1, 1999 the minimum charge was raised $0.38 to $3.23 per cubic metre, and was again raised on April 1, 2000 by $0.05 to $3.28 per cubic metre.
- A forest renewal charge to provide dedicated funding for forest renewal. This charge varies depending upon the tree species and the anticipated renewal cost for that species. Forest renewal charges are held in either a Forest Renewal Trust fund or a Forest Renewal Special Purpose Account and may only be used for regenerating and maintaining the health of Ontario's forests.
- A residual value charge, paid to the province's consolidated revenues by forest companies or individuals licensed to harvest timber. The calculation of this charge varies from zero in times of low forest product prices to about $20.00 per cubic metre when product prices are high.

The forest industry also pays into the Forestry Futures Trust (FFT) fund through a $0.48 charge per cubic metre of timber harvested. The FFT is managed by an independent committee established by the Crown and funds projects that meet MNR-approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a licensee becomes insolvent; forest protection from insect or disease infestation; or intensive stand management related to a critical wood supply.

Table 4 shows the direct payments from the forest industry to the various government accounts during the last five fiscal years. The Forest Renewal Special Purpose Account will be phased out once all Crown management units, currently under direct management by MNR, have been converted to SFLs.

Table 4

Crown Charge Payments by the Forest Industry ($000s)

Year	Area Charges	Forestry Futures Trust	Consolidated Revenue Fund	Forest Renewal Trust	Forest Renewal Trust & SPA (f)	Total Payments
1996-97	11,269.7	7,861.4	111,669.0	51,628.9	34,755.1	**217,184.1**
1997-98	(a)	10,576.7 (b)	178,063.2	52,373.5	44,159.0	**285,172.4**
1998-99		20,605.3 (c)	157,452.3	71,298.9	28,930.8	**278,287.3**
1999-00		10,050.7 (d)	155,695.7	78,668.1	5,147.9	**249,562.4**
2000-01		11,180.6 (e)	105,191.5	83,893.9	2,306.8	**202,572.8**

(a) Area charges are no longer collected separately. Area charges were incorporated into the minimum charge which is part of the funds payable to the Consolidated Revenue Fund.

(b) Includes conversion funds of $4,428,900 collected in 1997-98

(c) Includes conversion funds of $8,418,167 collected in 1998-99

(d) Includes conversion funds of $1,640,892 collected in 1999-00

(e) Conversion funds were no longer collected in 2000-01

(f) Amounts are as of March 31, 2001

Note: Funds in the Forest Renewal Trust, the Forest Renewal Special Purpose Account, and the FFT are not formally counted as revenue by the province, although funds in the Forest Renewal Special Purpose Account are held in the province's Consolidated Revenue Fund.

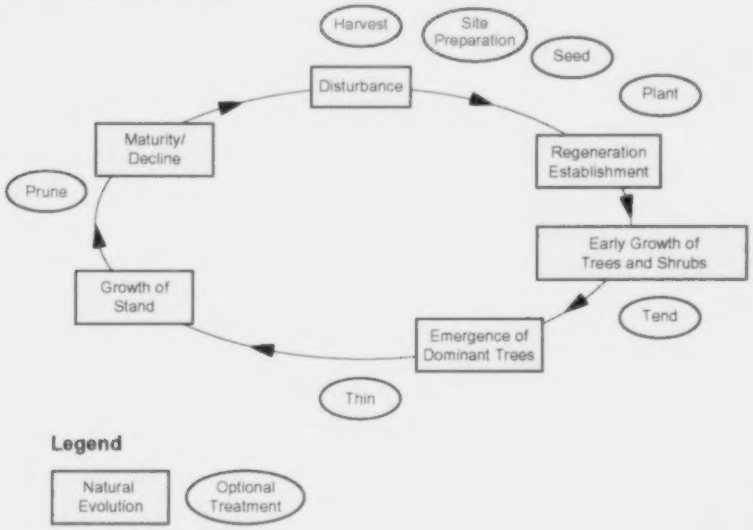
Chapter 5

Forest Disturbances

Forest management attempts to regulate or adapt to "disturbances" within the forest caused by natural (e.g., insects, disease, weather calamities, forest fires) and human (e.g., harvesting) activities. These disturbances are numerous and occur throughout the forest life cycle, illustrated in Figure 11.

Figure 11

The Forest Life Cycle


Harvest
Site Preparation
Seed
Plant
Disturbance
Maturity/ Decline
Regeneration Establishment
Prune
Early Growth of Trees and Shrubs
Growth of Stand
Tend
Emergence of Dominant Trees
Thin
Legend
Natural Evolution
Optional Treatment

Disturbances are measured in terms of forest area (hectares) and volume (cubic metres) of trees killed, damaged, or harvested. The degree to which a forest stand must be impacted by these disturbances before the inventory description is changed is a subjective decision. The change in volume and area in a forest stand that results from natural mortality every year is not usually significant enough to be recorded for inventory update purposes. For example, chronic diseases such as root rot may kill only a few trees scattered throughout the forest stand. Therefore, no area loss is recorded for this disease but an estimate of the volume of wood in the dead trees and volume of growth loss in the remaining live trees will be made. The most significant disturbances are reported in the fall of the year following a disturbance. Thus, the most recent disturbances reported in this 2000/01 report actually occurred during 1999/00. Reporting is delayed to allow time to completely map and inventory all disturbances that occurred during a given year.

Harvesting

The level of allowable harvest in a management unit is determined through the forest management planning process. Ministry of Natural Resources requires that the allowable harvest for a management unit be set at a level that will sustain a healthy forest over time. Harvesting in each management unit is controlled and monitored according to the approved forest management plan. These plans specify both allowable harvest area and the associated volumes. However, control of the allowable harvest is by area.

Silvicultural Systems Used in Ontario

Harvesting in Ontario is one of a series of actions that, when combined, represents a silvicultural system. Silvicultural systems combine harvesting, forest renewal, and tending and are classified according to the method of harvesting. Ontario uses three silvicultural systems:

Clearcut System

The entire merchantable growth is harvested in one operation, with or without leaving residual trees for silvicultural reasons (e.g. seed trees) or other values (e.g. martin habitat). Harvesting may be done in blocks, strips, or patches. Regeneration can be natural or assisted. This method will produce stands in which all the trees are at about the same period of growth, or age-class, and is referred to as even-aged management.

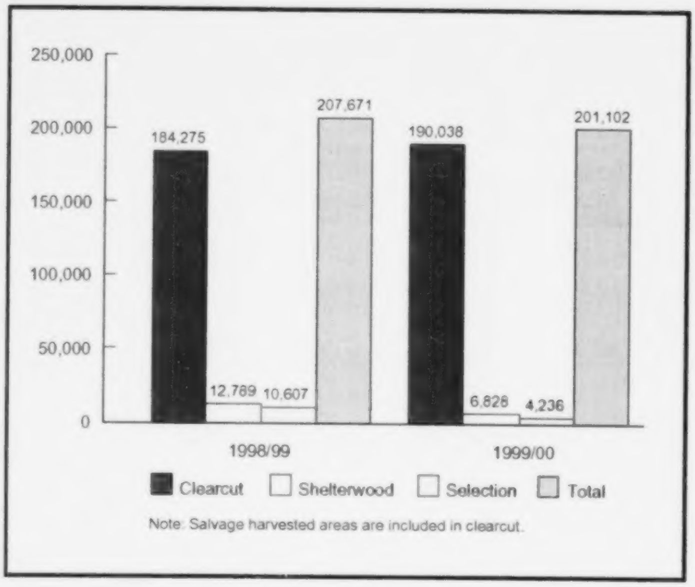
Shelterwood System

Mature trees are harvested in a series of two or more cuts to encourage natural regeneration under the residual trees. This may be done by cutting uniformly over the stand area or in groups or narrow strips. This method also produces stands in which the trees are approximately the same age.

Selection System

Mature and unhealthy or undesirable trees are continuously removed individually or in small groups over an entire area, over the forest life cycle. This method produces stands in which trees are of different ages and is referred to as uneven-aged management.

The breakdown of the total provincial area harvested in 1998/99 and 1999/00 by the three silvicultural systems is illustrated in Figure 12. This figure shows that the overall total harvest area decreased in 1999/00 from 1998/99 by about 6,600 hectares. Area harvested using the clearcut system actually increased by about 5,800 hectares while the shelterwood and selection systems decreased by about 6,000 hectares and 6,400 hectares, respectively.



Note: Salvage harvested areas are included in clearcut.

Figure 12

Area Harvested (hectares) by Silviculture System (1998-2000)

When large areas are burned or destroyed by windthrow or insects, forest companies often harvest some of the dead and damaged wood remaining on these sites. In 1999/00, about 4,100 hectares were salvaged while in 1998/99 there were about 4,200 hectares salvaged.

Figures 13 and 14 show provincial harvest areas and volumes, including fire and other disturbances, from 1995 to 1999. Over the past five years,

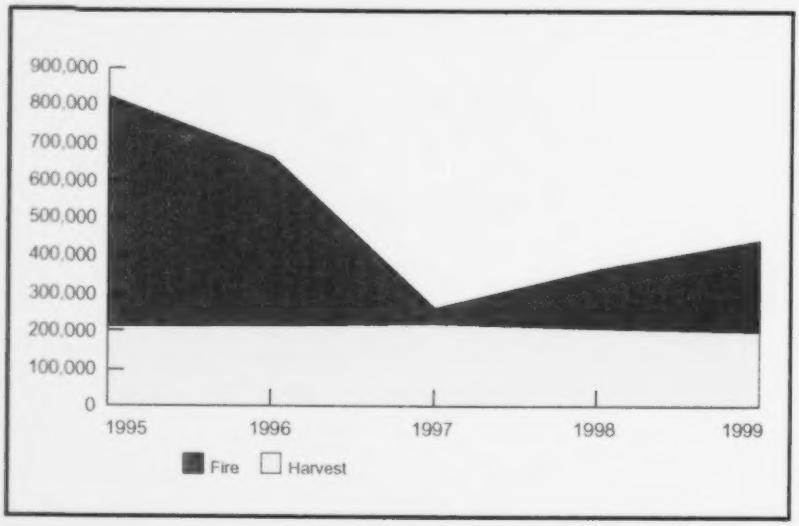
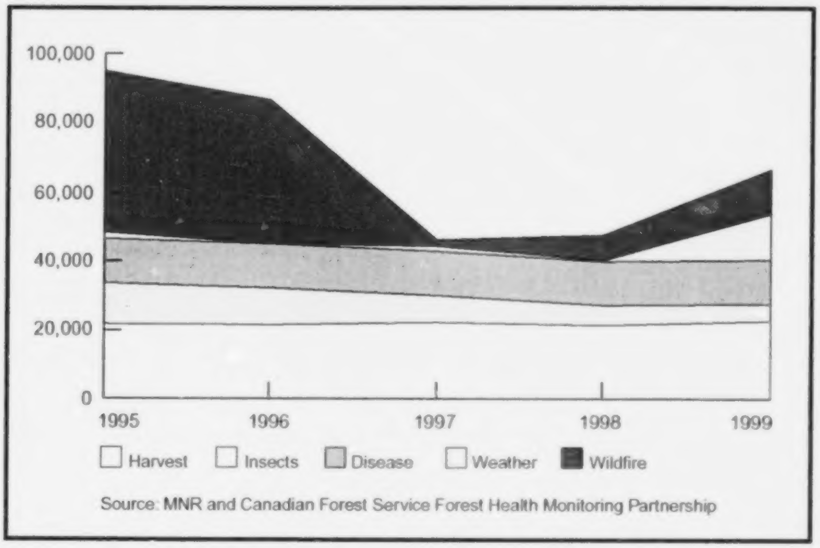


Figure 13

Forest Area (hectares) Disturbed by Harvest and Fire for All Crown Land (1995-99)



Source: MNR and Canadian Forest Service Forest Health Monitoring Partnership

Figure 14

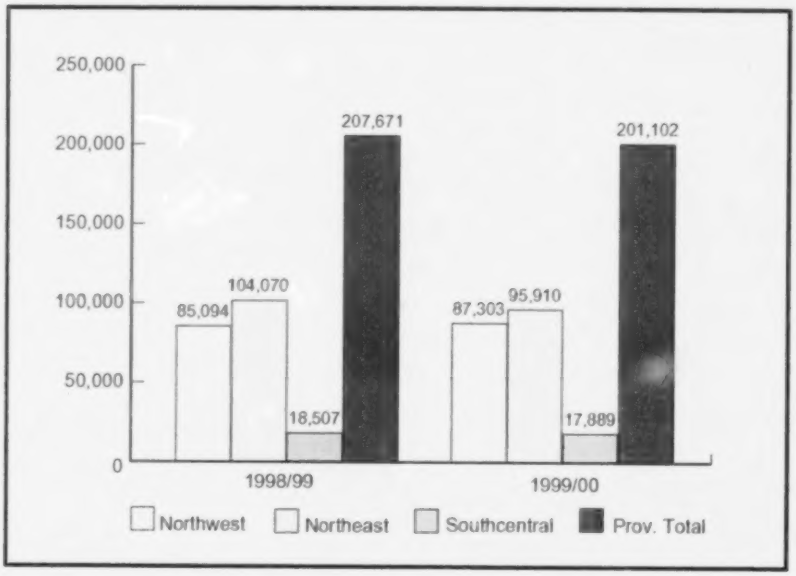
Wood Volume (000's cubic metres) for Harvest and Other Disturbances for the AOU (1995-99)

harvest area and volume has only fluctuated by about six percent. Since the recession in 1993, demands for products and harvest levels have rebounded and continue to reflect changing market conditions. Comparisons of natural and human disturbances to the forest over the five-year period from 1995 to 1999 are also shown in Figures 13 and 14.

Figure 15 shows the total area harvested in 1998/99 and 1999/00 by MNR administrative region. The total provincial harvest area of 201,102 hectares decreased by about two percent from 1998/99 to 1999/00. The largest regional harvest area was in Northeast Region (95,910 hectares), representing approximately 48 percent of the total. The Northwest Region had the second largest regional harvested area at 87,303 hectares, or 43 percent of the total. The Southcentral Region, which has a much smaller forest area, had the smallest total harvest at 17,889 hectares, or nine percent of the total. The regional breakdown of the harvest changed very little from 1998/99 to 1999/00.

Figure 15

Area Harvested (hectares) by MNR Region (1998-2000)



Wood volumes harvested in 1999/00 in MNR's three administrative regions are shown in Figure 16. Total provincial softwood and hardwood volumes harvested in 1998/99 and 1999/00 are shown in Figure 17.

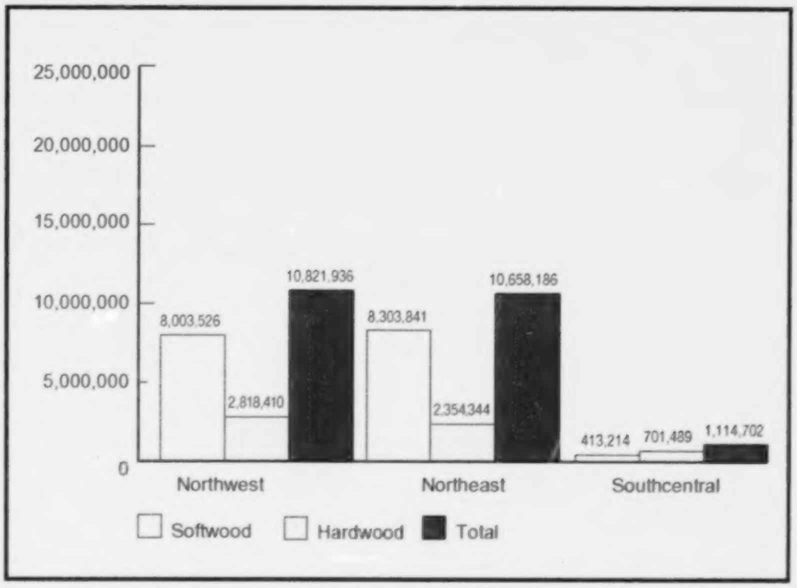


Figure 16

Wood Volume Harvest (cubic metres) by MNR Region and Species Group (1999/00)

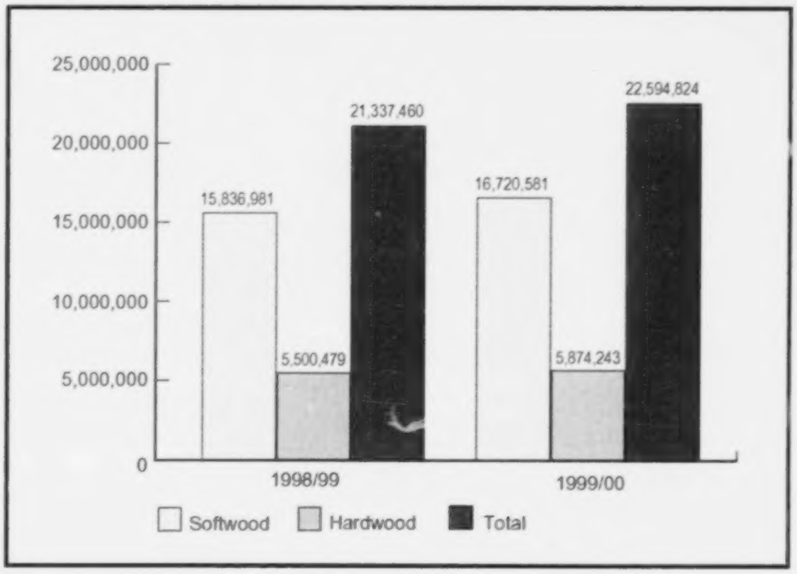


Figure 17

Hardwood and Softwood Volumes Harvested (cubic metres) on all Crown Land (1998-2000)

In 1999/00, the total *provincial harvest* volume was approximately 22.6 million cubic metres. The 1999/00 regional total harvest volumes were:

- Northwest Region – 10.8 million cubic metres (48 percent of the total harvest volume)
- Northeast Region – 10.7 million cubic metres (47 percent of the total harvest volume)
- Southcentral Region – 1.1 million cubic metres (5 percent of the total harvest volume)

Softwood tree species accounted for 74 percent of the total harvest volume with a total harvest of over 16.7 million cubic metres. This is a six percent increase over the 1998/99 softwood harvest. The 1999/00 regional softwood harvests were:

- Northwest Region – 8 million cubic metres
- Northeast Region – 8.3 million cubic metres
- Southcentral Region – 413,214 cubic metres

The total provincial hardwood harvest volume of over 5.9 million cubic metres accounts for 26 percent of the total harvest volume. This is a seven percent increase from the 1998/99 hardwood harvest. The 1999/00 regional harvest volumes for hardwoods were:

- Northwest Region – 2.8 million cubic metres
- Northeast Region – 2.4 million cubic metres
- Southcentral Region – 701,489 cubic metres

Ontario's forest harvest in 1999/00 was approximately 22.6 million cubic metres, which represents approximately a six percent increase over the 1998/99 harvest volume. This increase is mainly due to increases in the harvest of spruce (mostly black spruce) and poplar. Fluctuations in the harvest volumes of individual tree species from year to year are in large part due to changes in market demand and variations in the species encountered on the areas to be harvested. The harvest volumes by species for 1998/99 and 1999/00 are shown in Table 5. Starting in 1999/00 use of the "Other Softwood" and "Other Hardwood" species categories was discontinued.

Table 5

Provincial Harvest Volume (cubic metres) by Species (1998–2000)

Softwood Species	1998/99 Harvest	1999/00 Harvest
White Pine	428,476	487,382
Red Pine	228,838	210,434
Jack Pine	5,967,239	5,742,312
Spruce	8,632,913	9,630,317
Hemlock	15,874	19,540
Balsam	524,967	581,037
Cedar	11,541	26,348
Tamarack	24,940	23,211
Other Softwoods	2,193	0
Total Softwoods	**15,836,981**	**16,720,581**
Hardwood Species		
Maple	432,590	465,364
Yellow Birch	35,137	30,138
White Birch	265,682	269,613
Oak	39,224	31,709
Beech	30,730	26,802
Poplar	4,635,851	5,033,829
Basswood	12,981	12,327
Ash	3,134	3,306
Other Hardwoods	45,150	1,155*
Total Hardwoods	**5,500,479**	**5,874,243**
Provincial Totals	**21,337,460**	**22,594,824**

* The volumes for black cherry, ironwood, butternut, and elm are too small to be shown individually. They have been added together under Other Hardwoods.

Average and Maximum Size of Clearcuts

The CFSA promotes "using forest practices that within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air, and social and economic values, including recreational values and heritage values". The EA Decision provides for a range of clearcut sizes, not to exceed 260 hectares unless supported by biological or silvicultural reasons.

The EA Decision also recognized the need to make exceptions above the 260 hectare limit for biological and silvicultural reasons and that a range of various sizes was required. The CFSA embraces the principle to "emulate natural disturbances and landscape patterns." Efforts to prepare plans to address the need to provide a range of disturbance sizes have resulted in generally larger planned clearcuts with appropriate rationale provided in forest management plans.

Cut patterns, sizes, and distribution are developed based on 29 guidelines in accordance with natural conditions, historical disturbance and landscape patterns, forest types, silvicultural characteristics of tree species, and fish and wildlife habitat needs. When appropriate, forestry operations within cut blocks are further altered or prohibited to protect identified site-specific forest values by implementing measures (e.g., reserves and harvest restrictions) specified in the guidelines.

In this report, the area statistics for average and maximum size clearcuts generally refer to the area cut in a particular year, without consideration of harvests in previous years or nearby clearcuts (the *Forest Management Guide for Natural Disturbance Pattern Emulation* (NDPE Guide) was not approved when these areas were harvested). The NDPE Guide was approved in November 2001 and provides direction to forest managers on designing harvest areas to more closely resemble natural disturbances by leaving more standing trees, as individuals and peninsular and insular patches, scattered throughout irregularly-shaped harvest areas. While forest harvesting can never exactly duplicate natural disturbances in the forest, the NDPE Guide promotes timber harvesting practices that simulate the natural range of fire disturbances - both small and large. This variation in harvest pattern creates desirable habitat for wildlife species. Smaller disturbances favour the creation of habitat for species like moose and deer, because they create a lot of "edge" (where different forest types, features, or age classes come together). Larger disturbances, over time, create habitat for species which prefer large, uniform forests such as the American marten, the woodland caribou, and the great grey owl. As wildlife species have evolved in forest patterns that have largely been shaped by wildfire, the widest possible range of wildlife species will benefit by mimicking the broad range of natural disturbance patterns. The requirement in the NDPE Guide to retain trees on the harvest site will be incorporated into forest management plans that are scheduled for approval beginning in 2003. Full implementation of the NDPE Guide requirements will begin with those plans scheduled for approval in 2004. Consequently, in this report, the area statistics for average and maximum size clearcuts generally refer to the area cut in a particular year, without consideration of harvests in previous years or nearby clearcuts; the area statistics in this report reflect operations that pre-date the NDPE Guide.

Boreal Forest

Key guidelines used to design clearcut sizes and patterns within the Boreal Forest include: *Timber Management Guidelines for the Provision of Moose Habitat* and *Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach*.

The provision of moose habitat includes direction for range management and specific management for values such as aquatic feeding areas. In locations where significant woodland caribou populations occur, application of the woodland caribou guidelines takes precedence over moose habitat guidelines for determination of clearcut size.

In 1999/00, 46 management units within the Boreal Forest reported average clearcut sizes from 24 to 1,581 hectares. Maximum clearcut sizes reported ranged from 85 to 4,966 hectares.

Great Lakes-St. Lawrence Forest

Harvest planning in the Great Lakes-St.Lawrence (GLSL) forest must account for historic natural disturbance regimes, cover types, landscape patterns and wildlife habitat management practices. It is assumed that the landscape-level needs of most species will be met if forest management is conducted to maintain a landscape with the same mix of ecosites and age classes in patterns similar to those that occurred in the natural pre-settlement forest.

In the Great Lakes-St.Lawrence forest, the primary stand replacing natural disturbance agents have been a combination of wind and fire events.

Through an ecosystem management approach to landscape-level management, managers attempt to address habitat requirements for many wildlife species. Specific habitat requirements of selected species are also considered. Some species are area sensitive and need large blocks of forest; for example, pileated woodpecker (*Dryocopus pileatus*); others prefer small patches and an abundance of edge; for example, white-tailed deer (*Odocoileus virginanus*); and others require a complex mosaic of forest types and ages; for example, moose (*Alces alces*). To provide for a diversity of needs, a variety of cut sizes are necessary.

Approximately 25 percent of the harvested areas are cut using the clearcut method, 30 percent are harvested using the shelterwood method, and the remainder are harvested through the selection system.

In 1999/00, 14 management units within the Great Lakes-St. Lawrence Forest reported average clearcut sizes from 5 to 109 hectares. Maximum clearcut sizes ranged from 15 to 272 hectares.

Natural Disturbances

Natural disturbances include fire disturbances and damage from insects, disease, and severe weather conditions. The intensity of disturbances varies from year to year.

Forest Fires

The number and size of forest fires varies dramatically from year to year, depending on the weather. This is clearly indicated in Figure 13. Ministry of Natural Resources records the area disturbed by forest fires across all the forested area of the province, not just for the AOU as is the case for harvest depletions. During the period 1995-1999, annual fire disturbances peaked in 1995 at more than 611,000 hectares of forest burned. The smallest annual area disturbed by fire in that period occurred in 1997 when 37,712 hectares was burned.

The total fire disturbance for 1999/00 within the AOU amounted to 65,245 hectares. This represents about 27 percent of the total provincial forest area burned that year. The other 73 percent occurred outside the AOU, mostly in the far north.

Depending on the severity of the damage to trees from fire, it is often possible to conduct salvage operations to harvest killed or damaged trees. Salvage operations are reported as harvesting.

Figure 14 shows the estimated volume of wood lost to forest fires from 1995/96 to 1999/00 in comparison with harvest volumes and volume losses caused by insects, disease, and weather. Fire volume losses over this period correspond closely with fire area losses. Fire volume losses peaked in 1995 at more than 46 million cubic metres. The smallest annual fire loss occurred in 1997 when 1.8 million cubic metres were burned.

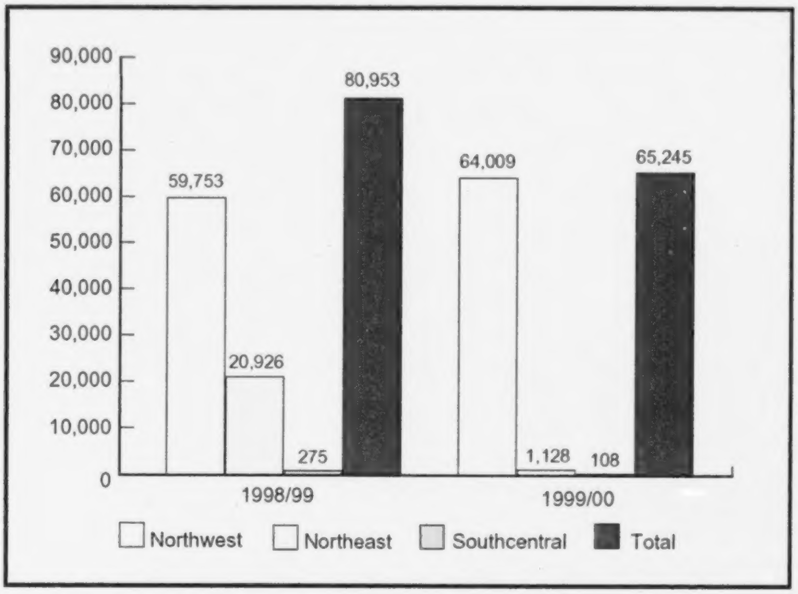


Figure 18

Area Disturbed by Forest Fire (hectares) by MNR Region (1998-2000)

Figure 18 shows the area disturbed by forest fires during 1998/99 and 1999/00 in the AOU by administrative region. The total area burned in 1999/00 decreased to 65,245 hectares from 80,953 hectares in 1998/99. Ninety-eight percent of the area burned within the AOU in 1999/00 was within the Northwest Region.

Insects, Disease, Severe Weather

Estimates of volumes lost from 1995 to 1999 due to insects, disease, severe weather, and forest fires are shown in Figure 14. These estimates pertain to Crown production forest within the Planning Area only. This figure shows that insect losses were at their lowest in 1999 (over 4.9 million cubic metres) and at their highest in 1995 (over 11.8 million cubic metres). The magnitude of these losses has not been adjusted to reflect abnormal impacts from losses which have always been a part of natural forest growth and succession.

The volume losses due to tree mortality caused by insects, disease, and severe weather (e.g., drought, windstorm) shown in Figure 14 are based on studies done for the years 1988 to 1999 by the Forest Health Monitoring Unit of the Canadian Forestry Service (CFS) and MNR. Mortality and growth losses in surviving trees are included in the estimates. Depending on the severity of damage to trees from insects, disease, or severe weather, it is often possible to conduct salvage operations to harvest timber and reduce the threat of forest fires.

The wood volumes estimated to have been lost in 1998/99 and 1999/00 by natural causes are given in Table 6.

Table 6

Estimated Wood Volumes Lost to Natural Causes on Crown Production Forest Within the Planning Area

Disturbance Type	1998/99 Volume Losses (cubic metres)	1999/00 Volume Losses (cubic metres)
Insects	5,813,900	4,938,700
Disease (Chronic)	12,740,700	12,795,400
Severe Weather	271,200	13,310,700
Total	**18,825,800**	**31,044,800**

Insect Damage

The damaged area and volume loss caused by the most destructive insects are based on estimates of forested areas on which 30 percent or more of the foliage was removed. Usually, a number of years in which defoliation occurs is required to kill a tree; this varies for each pest, the tree species being attacked, and other factors. Insects that do significant damage to Ontario's forests include the spruce budworm, the jack pine budworm, the forest tent caterpillar, and a number of insects that chronically attack poplar and white birch. The estimated volume losses in 1998/99 and 1999/00 due to mortality and growth losses for each of these insects are given in Table 7.

Table 7

Estimated Volume Losses by Insect Species Within the Planning Area

Insect	1998/99 Volume Losses (cubic metres)	1999/00 Volume Losses (cubic metres)
Spruce Budworm	5,208,500	3,921,600
Jack Pine Budworm	0	0
Forest Tent Caterpillar	564,600	848,700
Gypsy Moth	0	0
Other Poplar/Birch Insects	40,800	168,400
Total	**5,813,900**	**4,938,700**

Forested areas may be defoliated by more than one insect. Area reported as defoliated may include different degrees of severity.

Diseases

Losses due to disease are shown to be relatively consistent over the period because these losses are normally chronic and are estimated by calculating an annual average loss for all chronic diseases over specific study periods. Estimates consist of mortality and growth losses caused by rot, stem decay, and foliage dieback. Annual volume losses in 1998/99 of over 12.74 million cubic metres increased slightly to over 12.79 million cubic metres in 1999/00.

Severe Weather

The most common weather disturbances causing significant tree mortality and volume losses are windstorms (damage is commonly referred to as "blowdown") and drought. Estimated severe weather volume losses from 1995 to 1998 were relatively minor compared to the estimated losses in 1999. Over 13.3 million cubic metres were estimated to have been lost in 1999, mainly due to windstorms.

Windstorms occur periodically but must affect a sizable area in order to be recorded. The areas reported as being damaged by windstorms in 1998/99 and 1999/00 are shown in Figure 19, by administrative region. The total area damaged in 1999/00 was about 28,000 hectares, which was a major increase from the total of 459 hectares reported in 1998/99. Most of this damage was the result of severe windstorms that occurred in July 1999.The Lakehead Forest, (just west of Thunder Bay) in the

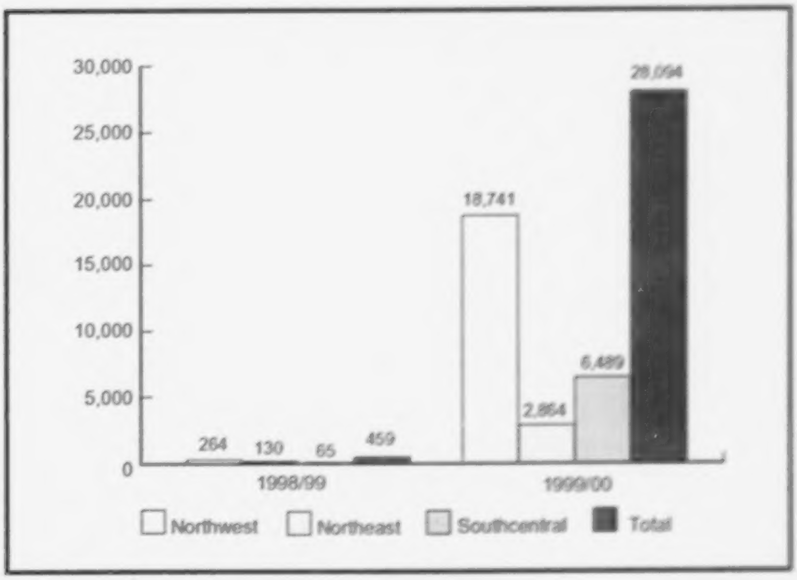


Figure 19

Windstorm Damaged Area (hectares) by MNR Region (1998-2000)

Northwest Region reported the largest area of blowdown at over 10,000 hectares. In the Northeast Region, the Pineland Forest (near Timmins) reported windstorm damage of over 1,700 hectares. In the Southcentral Region, Algonquin Park reported windstorm damage that exceeded 6,000 hectares. These figures were reported by individual management units and are not part of the volume estimates provided by the forest health surveys.

The Ice Storm of '98

In January of 1998, a major ice storm damaged more than 604,000 hectares of forest in Ontario. Most of this damage occurred on private land and, therefore, was not included in previously listed severe weather statistics. After the storm, a joint program was established between the CFS and the MNR to assess the damage to forests and to evaluate recovery. The area affected by the ice storm was mapped from a helicopter and about 604,000 hectares were determined to be impacted to varying degrees. To monitor tree health in the affected area, permanent sample plots (PSPs) from the CFS forest health monitoring system and plots from the OMNR growth and yield program were utilized, as these provided information on stand conditions and tree mortality prior to the storm. Each plot was assessed for crown damage and whole tree mortality in 1998. Conifer species were generally less damaged than hardwoods, and damage to conifers was less continuous than hardwoods. Hardwood tree species showing the greatest damage were poplars, basswood, beech, soft maple, and birch; those showing the least damage were hard maple, oak, and elm species. Generally, smaller diameter trees showed more damage than larger trees. The ice storm caused significant mortality to silver maple, basswood, ash, and aspen in 1998, although mortality in 2000 and 2001 following the ice storm was in the range of one to two percent. Significant wounding was found on damaged plots and decays and other diseases are considered to be a serious long-term problem to the ice-damaged hardwood forest due to the numerous wounds in affected areas.

Chapter 6

Forest Renewal and Maintenance

Under the terms of the CFSA, forest managers have the responsibility to fully renew the forests where they operate. Sustainable Forest Licence holders are required to ensure that areas harvested are renewed to specific silvicultural standards as established in forest management plans, to ensure the long-term health of Crown forests.

Renewal

Activities needed to ensure the successful regeneration of all harvested areas are specified in all approved forest management plans in Ontario. Crown forests are renewed by both assisted and natural regeneration techniques, and these activities are reported annually.

The two most common types of assisted regeneration are planting and seeding. Planting includes planting of bareroot seedlings and container seedlings. Container seedlings made up 98 percent of the stock used in planting programs across the province in 2000/01. Seeding may be done directly from aircraft or by broadcast seeders on the ground. Renewal activities also include preparing an area disturbed by harvest or natural causes for regeneration through mechanical or chemical means, or by a prescribed burn. The time period from harvest to completion of the planting or seeding may be up to five years, and is often referred to as the regeneration establishment period.

Many tree species can reestablish themselves on a site without planting or seeding. These natural mechanisms include seeding from the adjacent forest or from cones left on site after the harvest, suckering of stumps and roots, and growth of young trees remaining on the harvested area. This natural regeneration can be enhanced through careful selection of the silviculture system and harvest method (see Chapter 5) and commences immediately after harvesting is complete.

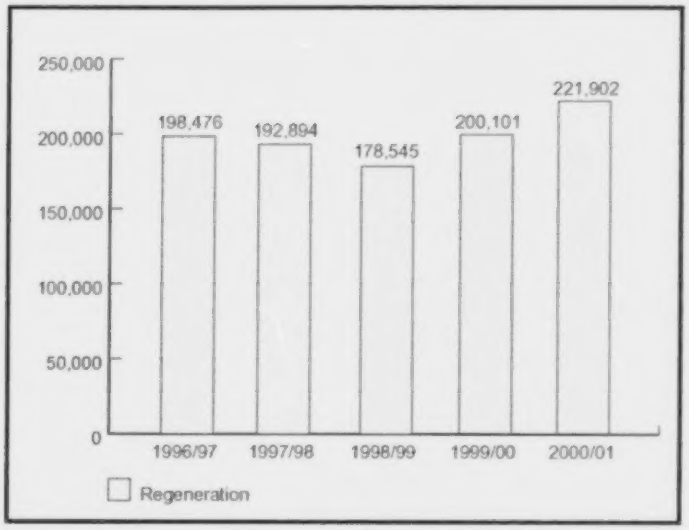


Figure 20

Provincial Forest Regeneration (hectares) 1996-2001

In the past, reporting of natural regeneration annually at the time of harvest was not emphasized because some forest managers preferred to report it periodically after regeneration surveys had been completed. This delay in reporting, plus the regeneration establishment period, has resulted in the reported annual renewal levels being substantially less than the reported annual harvest levels. In 1996, new reporting procedures came into effect that require natural regeneration to be reported promptly upon completion of the harvest.

Reported levels of regeneration (including both natural and assisted regeneration) over the years 1996/97 to 2000/01 are shown in Figure 20. Regeneration levels tend to follow fluctuations in harvest and, to a lesser degree, forest depletions from natural causes such as forest fires and insect epidemics. The provincial forest regeneration level of 221,902 hectares shown in 2000/01 is the highest over the last five years. Previously, the highest regeneration level was in 1999/00 when it reached 200,101 hectares.

Comparison of reported harvest and regeneration levels on an annual basis is not appropriate because of the regeneration establishment period and the reporting delay. Comparison of average harvest and regeneration levels over a five-year period is more appropriate, but it will require several years before the new reporting requirements in Ontario make this comparison meaningful. The information is included here for baseline tracking purposes. The average total provincial harvest area over the five-year period from 1994/95 to 1998/99 was approximately 213,000 hectares. The average total provincial regeneration level over the five-year period from 1996/97 to 2000/01 was approximately 198,000 hectares, or about seven percent less than the average harvest level. More complete reporting requirements should result in regeneration levels growing closer to harvest levels over the next few years.

Table 8 summarizes the renewal operations conducted on Crown land in 2000/01 for the province and for each MNR region. The area renewed in 2000/01 includes areas harvested and burned in 1999/00 or earlier.

Selection cutting shown in Table 8 was carried out in tolerant hardwood stands in the Southcentral and, to some extent, in the Northeast Regions.

Table 8

Provincial Renewal Operations (2000/01)

REGENERATION UNEVEN-AGED MANAGEMENT	Northwest	Northeast	Southcentral	Total
Selection cut (hectares)	0	2,356	11,609	**13,965**
Total uneven-aged management	**0**	**2,356**	**11,609**	**13,965**
EVEN-AGED MANAGEMENT				
Natural regeneration (hectares)				
Clear cut	26,414	67,819	2,352	**96,585**
Strip cut	227	0	0	**227**
Seed tree cut	2,106	162	259	**2,527**
Uniform shelterwood cut	13	3,073	5,386	**8,472**
Subtotal natural regeneration	**28,760**	**71,054**	**7,997**	**107,811**
Assisted (artificial) regeneration				
Planting (hectares)	40,495	39,538	1,683	**81,716**
Trees(000's)				
Bareroot	2,034	632	315	**2,981**
Container	63,320	54,996	1,418	**119,734**
Cuttings	0	0	0	**0**
Seeding (hectares)				
Direct	8,987	2,693	0	**11,680**
With site preparation	4,622	587	0	**5,209**
Scarification (hectares)	377	207	936	**1,520**
Subtotal Assisted Regeneration (hectares)	**54,481**	**43,025**	**2,619**	**100,125**
TOTAL REGENERATION (hectares)	**83,241**	**116,435**	**22,225**	**221,901**
SITE PREPARATION (hectares)				
Mechanical	42,562	26,493	2,282	**71,337**
Chemical	999	2,964	567	**4,530**
Prescribed burn	586	5	120	**711**
TOTAL SITE PREPARATION (hectares)	**44,147**	**29,462**	**2,969**	**76,578**
TOTAL RENEWAL ACTIVITIES (hectares)	**127,388**	**145,897**	**25,194**	**298,479**

Approximately 40 percent more area was managed under this system in 2000/01 than in 1999/00, due mainly to increased harvest levels. Clearcutting is the silvicultural system of choice in the Northeast and Northwest Regions, with a 30 percent increase in the area clearcut over the past year. Clearcutting took place mainly in stands containing jack pine, black spruce, poplar, and white birch. The seed tree system was primarily applied in white pine and red pine stands in the Northwest Region. Uniform shelterwood was used mainly in both white pine and tolerant hardwood stands in the Northeast and Southcentral Regions. The choice of which silvicultural system to use is largely dependent on the biological requirements of the different tree species.

The area of natural regeneration reported was significantly higher in 2000/01 than in previous years. The largest increase for area reported as clearcut with natural regeneration was in the Northeast Region. This was due to an increase in the use of Careful Logging Around Advance Growth (CLAAG) practices in this region as well as the reduction in reporting delays discussed earlier in this chapter. Careful Logging Around Advance Growth is an operational practice where the objective is to remove the overstorey, protect understorey advance growth, and regenerate an even-aged stand. Another operational practice known as Harvesting With Regeneration Protection (HARP) is applicable only in uneven-aged lowland black spruce. HARP protects and retains stems below a set diameter, leaving an uneven-aged and uneven-sized stand.

Assisted regeneration activities decreased from 1999/00 to 2000/01. There is a trend towards the effective use of natural regeneration, especially operating with the clearcut system in the Northwest and Northeast Regions. In many cases, natural regeneration can be supplemented with "fill in" planting and then spaced to produce an acceptable stand.

The use of bareroot seedlings further decreased in 2000/01, and made up only two percent of the total planting activity in the province. Container stock was used in the other 98 percent of the program. This follows the continuing industry trend towards the increased use of container stock to meet planting requirements. The total number of seedlings planted in 2000/01 was 123 million, a reduction of ten percent from 1999/00. The reason for this reduction is the trend towards the use of natural regeneration and "fill in" planting, which utilizes less planted stock. There was a corresponding reduction in the area planted.

Jack pine is the main species used for seeding, most of which was done in the Northwest Region and, to a lesser extent, in the Northeast Region. There was a reduction in the use of direct seeding in the Northwest Region, again due to the increased used of natural jack pine regeneration. Black spruce is also seeded on lowland sites in the Northeast Region only. The overall seeding levels were somewhat lower in 2000/01 than in 1999/00. The total area regenerated (including both assisted and natural) increased in 2000/01 compared to 1999/00.

Mechanical site preparation is the main site preparation method used in all regions, followed by chemical site preparation then prescribed burning. Provincially, the total area treated with site preparation decreased 18 percent from 1999/00 to 2000/01.

Tending and Protection

Tending includes the operations of weeding, cleaning, thinning, spacing, and cultivation. Forest tending operations are carried out to improve the survival, growth, or quality of a regenerating forest. Tending may be done in young stands to help attain Free-To-Grow (FTG) status. Tending may also be conducted in uneven-aged stands to maintain the desired age-class distribution and volume. Protection operations prevent or manage the damage caused by insects and diseases.

Table 9 summarizes the tending and protection activities conducted on Crown land in 2000/01 for the province and for each MNR region. Reported levels of tending were down 15 percent in 2000/01 from 1999/00.

The total area tended decreased in 2000/01, mainly due to a 15 percent reduction in chemical aerial cleaning in the Northwest and Northeast Regions. This, combined with a decrease in the even-aged spacing, precommercial thinning, and improvement cutting in the Northwest, led to an overall reduction of 15 percent. In addition, there was a reduction in the amount of manual cleaning carried out in the Southcentral Region although there was an increase of similar treatments in the Northwest. Uneven-aged stand improvement work increased by 25 percent in 2000/01 in the Northeast and Southcentral Regions, with most of this type of work done in the Southcentral Region in tolerant hardwoods. No protection activity was reported in 2000/01.

Table 9

Provincial Tending and Protection Activities (2000/01)

TENDING (hectares)	**Northwest**	**Northeast**	**Southcentral**	**Total**
Cleaning				
Manual	653	522	848	**2,023**
Chemical – ground	1,260	1,901	799	**3,960**
Chemical – aerial	24,185	41,449	1,035	**66,669**
Mechanical	0	30	0	**30**
Spacing, Precommercial Thinning, Improvement Cutting (hectares)				
Even-aged	3,145	2,069	453	**5,667**
Uneven-aged	0	2,320	7,378	**9,698**
TOTAL TENDING	**29,243**	**48,291**	**10,513**	**88,047**

PROTECTION (hectares)				
Accelerated Harvest				**0**
Salvage				**0**
Manual Protection				**0**
Ground Insecticide				**0**
Aerial Insecticide				**0**
TOTAL PROTECTION	**0**	**0**	**0**	**0**

Funding for Forest Renewal

The financial mechanisms established under the CFSA and outlined in Chapter 4 ensure that there will always be funding available for forest renewal.

Each company with an SFL contributes the appropriate level of renewal charges to an account in the Forest Renewal Trust fund. These funds may only be used to conduct eligible silviculture work on the specific licence area from which the funds were generated upon harvest.

Operators with an FRL, who do not operate on an SFL, pay their renewal charges into the Forest Renewal Special Purpose Account. This account provides dedicated funding for forest renewal on management units

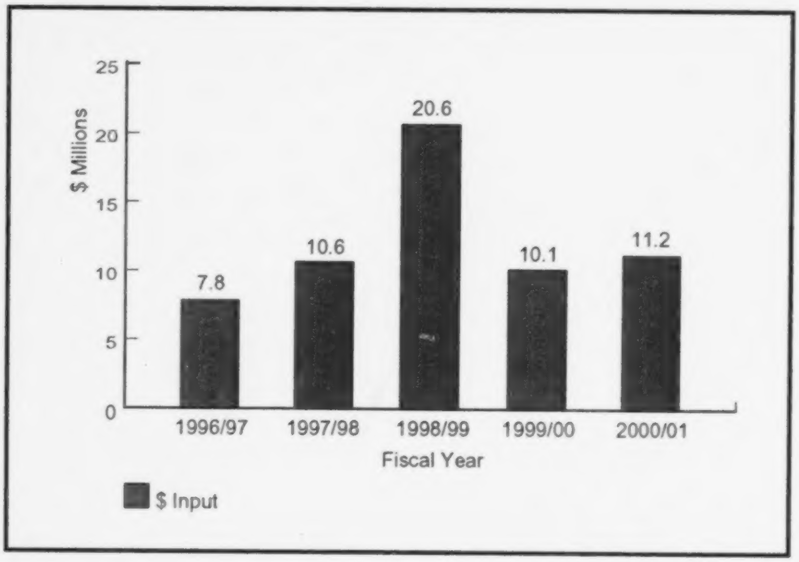


Figure 21

Forestry Futures Trust Fund:

Annual Funds Input as of April 1, 2001

where harvesting and other operations are conducted on Crown land by companies that do not hold SFLs.

The Ministry of Natural Resources is responsible for administration of the Forest Renewal Special Purpose Account. As with the Forest Renewal Trust fund, each forest or management unit has its own separate account to cover forest renewal costs.

Money for a third fund, the FFT, came in 1999/00 from a portion of the Crown charges that all licensees paid. In addition, any administrative penalties assessed under the CFSA are paid into the FFT. The FFT, managed by an independent committee established by the Crown, funds projects that meet MNR-approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a licensee becomes insolvent; forest protection from insect or disease infestation; or, intensive stand management related to a critical wood supply.

The annual contributions to the FFT are summarized in Figure 21. The amounts shown through 2000/01 are actual values. The funds deposited to the FFT fund in 2000/01 amounted to about $11.2 million.

Transition funding was provided initially by MNR to the Forest Renewal Trust accounts and Forest Renewal Special Purpose Accounts to provide an adequate level of "start-up" capital and to ensure ongoing viability of the accounts.

Bareroot stock:

Seedlings that have been grown in an outdoor environment and in the soil of a compartment in a nursery. These seedlings are lifted and the soil removed from the roots prior to shipment for planting.

Container stock:

Seedlings, usually grown in a controlled environment such as a greenhouse, that are grown in some form of container. These seedlings, when shipped for planting, retain the growing media around their roots.

Site preparation:

Disturbance of the forest floor, upper soil horizons and vegetation to create suitable conditions for assisted regeneration by mechanical or chemical means, or by prescribed burning.

Scarification:

Mechanical preparation of a site for natural regeneration.

Prescribed burn:

The knowledgeable application of fire to a specific land area to accomplish predetermined resource management objectives.

In addition to these trust funds and special purpose accounts, MNR supports forest renewal through the operation of the Ontario Tree Seed Plant and tree improvement programs.

Total forest renewal expenditures in 2000/01 were $109.1 million, which was approximately a six percent increase over the previous fiscal year. Sources of these expenditures were:

• Direct MNR expenditures	$1 million
• Forest Renewal Trust fund	$93.7 million
• FFT fund	$12.2 million
• Special Purpose Account	$2.2 million

In 2000/01, some adjustments to renewal rates took place on individual management units to reflect the local costs of renewing various species and to reduce some accumulated surpluses in individual Forest Renewal Trust Fund accounts. These rates will continue to be reviewed and adjusted annually to ensure adequate levels of renewal funding is maintained. A complete listing of the 2000/01 renewal rates for each management unit is provided in Appendix 5.

Cleaning:
A manual, mechanical, or chemical operation in a young stand to reduce, eliminate, or suppress undesirable competing vegetation. Cleaning promotes survival and growth in desirable trees by removing competing vegetation of similar age that may overtop them or are likely to do so.

Improvement cutting:
The elimination or suppression of less desirable trees in favour of more desirable trees, typically in a mixed, uneven-aged stand.

Thinning:
A cutting made in an immature stand to accelerate growth of the trees left uncut. The goal is to foster quality growth and improve sanitation.

Commercial thinning:
Removing trees from a developing young stand, so that the remaining trees will have more growing space, dead and dying trees will be salvaged, and the operation will make a net profit.

Pruning:
The removal of live or dead branches from a standing tree.

Chapter 7

Forest Access

Most forest access roads on Crown land are planned, constructed, and paid for by the forest industry. The forest management plan for each management unit describes the location, construction, maintenance, and use management of access roads that exist, or are planned for construction. These roads are essential for carrying out forest management activities. They also provide public access to provincial Crown land for tourism, outdoor recreation, mining, and other activities.

This report provides information on the construction of primary and secondary forest access roads. It provides information on road maintenance activities, which include grading, snow plowing, realignments, flood repairs, bridge repairs, and any other activity necessary to maintain existing roads. This chapter also reports on controlling access to roads, implementation of abandonment measures, and how this work was funded.

Road Construction and Maintenance

Figure 22 shows total provincial road construction in 2000/2001 for primary and secondary forest access roads in each MNR region. Total primary and secondary road construction for 2000/01 amounted to approximately 608 kilometres, which is about a 15 percent increase from the 1999/00 construction total of 528 kilometres. There were 127 kilometres of primary roads constructed in the province and 481 kilometres of secondary roads.

Figure 23 shows total provincial road maintenance in 2000/01 for each MNR region. Total road maintenance for the year was carried out on approximately 14,917 kilometres of primary and secondary roads, which is about a five percent decrease over the 1999/00 total of 15,645 kilometres.

ROAD CLASSES

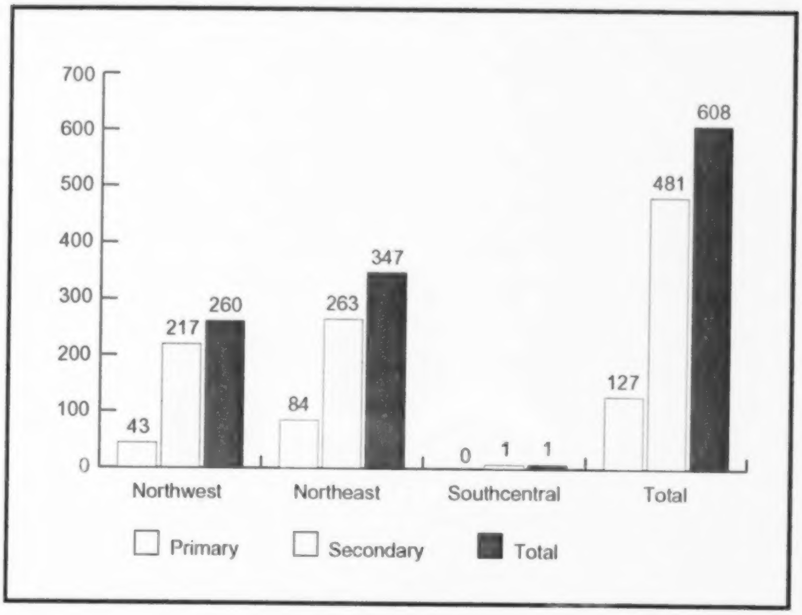
Primary Roads:
Essentially permanent roads. They are regularly maintained with a life expectancy in excess of 15 years.

Secondary Roads:
Essentially branches off primary roads. They are not considered permanent and are not normally maintained beyond their 5- to 15-year period of use.

Tertiary Roads:
Built for short-term use (i.e., up to five years). They are not maintained beyond their period of use.

Figure 22

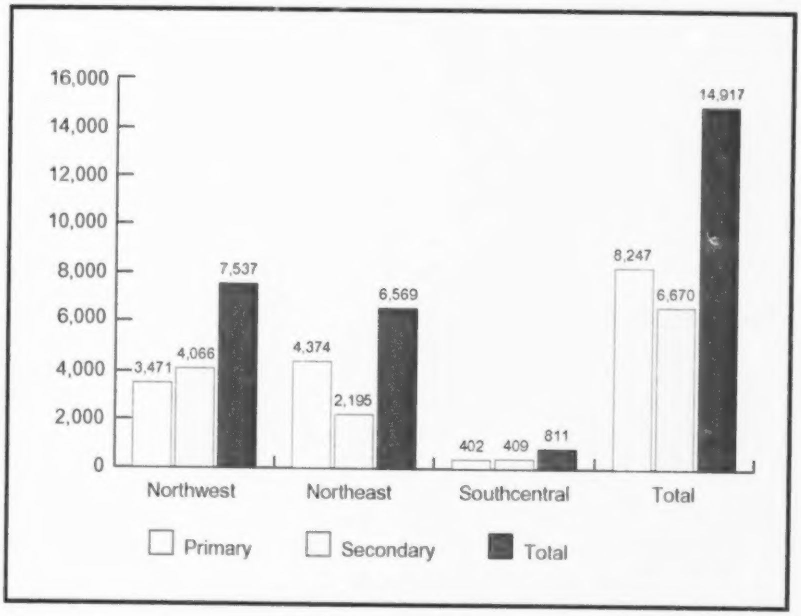
Road Construction (kilometres) in 2000/01 by Road Class and MNR Region



In 2000/01 the forest access road program, funded by MNR and Ministry of Northern Development and Mines (MNDM), spent $5.5 million on the reconstruction and maintenance of forest access roads in northern Ontario. Most of the roads funded under MNR and MNDM's program serve several purposes, including public access and forest management.

Figure 23

Road Maintenance (kilometres) in 2000/01 by MNR Region



Road Abandonment and Access Control

Road abandonment and access control must be planned in advance of construction and documented in the forest management plan for each management unit. These activities must also be reported in the management unit annual report.

Figure 24 shows the total length of primary and secondary roads that were abandoned in each MNR region in 2000/01. In total, 148 kilometres of road were abandoned. This total included 126 kilometres in the Northwest Region and 22 kilometres in the Northeast Region. The method of abandonment for the majority of these roads was natural abandonment.

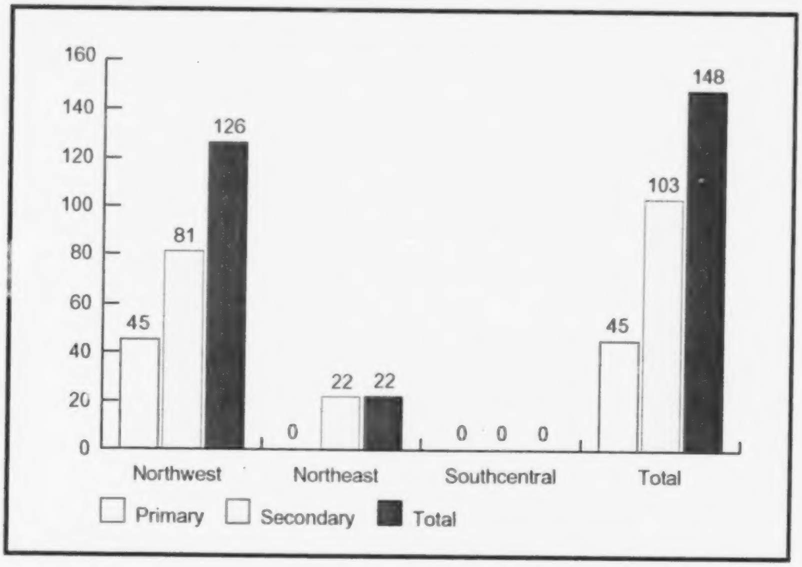


Figure 24

Road Abandonment (kilometres) in 2000/01 by Road Class and MNR Region

For reasons of public safety and/or resource management, access roads may be closed to certain uses on a temporary, seasonal, or permanent basis. Methods used to control access can generally be classified into two categories: erecting signs to advise the public of the restriction (referred to as "signage"); or, erecting gates or using other physical means such as ditching (referred to as "gated" or "physical barrier").

Figure 25 shows the length of primary and secondary roads that had controlled access during 2000/01 in each MNR region. A total of about 3,699 kilometres of road had access controls, consisting of 1,420 kilometres in the Northwest Region, 1,611 kilometres in the Northeast Region and 668 kilometres in the Southcentral Region. Provincially, access was restricted on 1,438 kilometres of road by gating and on 1,057 kilometres of road by signage. Another 1,204 kilometres of road had access control through unspecified means and are shown in the "other" category in Figure 25.

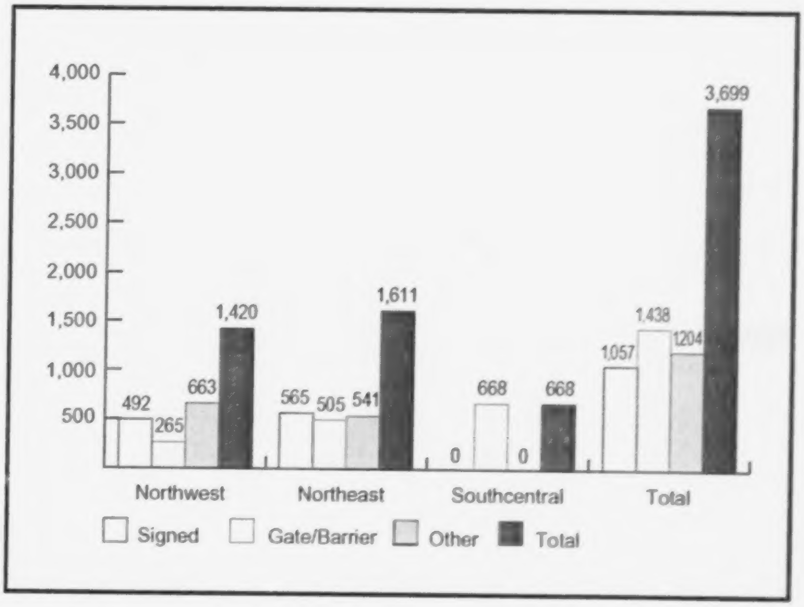


Figure 25

Road Access Control (kilometres) in 2000/01 by Control Method and MNR Region

Access Control:

The closure of a road to public travel or the restricted access to a road for certain specified uses for given periods of time.

Road Abandonment:

The use management strategy adopted when a road has fulfilled its original use and is no longer required, or when maintenance cannot be justified.

Natural Abandonment:

The natural degradation of a road when it is not maintained. Road maintenance has ceased and steps are not taken to prevent the use of the road by vehicular traffic through means of physical disablement.

Physical Abandonment:

A deliberate act to render a road unusable by vehicular traffic. For example: gating, ditching, bridge or culvert removal, etc.

Chapter 8

Monitoring and Compliance

Forest operations in Ontario are monitored and audited to assess compliance and evaluate progress and results. There are three types of monitoring: effectiveness, effects, and compliance. The information collected and analyzed for effectiveness monitoring determines how well the forest is growing. Effects monitoring assesses the impacts of operations on various aspects of the forest ecosystem through long-term studies. Compliance monitoring is conducted to ensure that MNR and the forest industry carry out operations according to plans, regulations, and the required standards. Forest Management is also audited through Independent Forest Audits, providing independent published audits of management units across the province.

Forest Auditing

Independent Forest Audits are a requirement of the CFSA, T & C #86 and T & C #87 of the EA Decision, and are a condition of SFLs. All management units, both Crown and SFL, are audited at least once every five years to review actual operations and examine the forest management activities carried out over the previous five years.

The audit is a systematic and documented verification process to assess adherence to the forest management plan and the planning process. Assessing the interpretation and application of provincial legislation, manuals, policies, and guidelines at the management unit level is also part of the audit. Auditors examine the effectiveness in achieving the planned objectives and provide an assessment of forest sustainability for the management unit. Audit teams review licensee compliance with the obligations of their specific SFL.

In order to address the audit purpose and objectives, the audit process and protocol document sets out the forest management principles, criteria, and procedures for undertaking Independent Forest Audits. The audit protocol identifies eight guiding principles, identified by the following titles: commitment, public participation, forest management planning, plan implementation, systems support, monitoring, achievement of management objectives and forest sustainability, and contractual compliance. For each principle, a series of specific criteria are identified that, when met, will result in achievement of the principle.

The audit terms of reference are the same for all Independent Forest Audits, including the audit team personnel requirements. Each audit team consists of a lead auditor who is trained in auditing procedures, has current auditing experience, and is supported by an audit team. The audit team consists of a minimum of two foresters with experience in forest management planning and forest operations, an individual trained in forest ecology or wildlife management, and a minimum of one person with experience in assessing socio-economic information, public consultation processes, and First Nations involvement in forest management planning. All members of an audit team must have a minimum of seven years recent and relevant experience in forest types similar to those being audited. Also, they must be independent of the operations they audit as well as free from conflict of interest throughout the process. The audit team must include a Registered Professional Forester. For the 2000 audits, the audit team was required to provide an audit against the requirements that were in effect during the audit period and prepare the subsequent report for publication.

Action plans must be developed in response to each audit report. The licensee and the MNR district responsible for the management unit jointly develop the action plan. For each recommendation in the audit report, the action plan must state the required action, the organization and individual responsible for the work, deadline dates, and a method of tracking the progress of the action plan. A status report for the action plan is also required two years after acceptance of the audit report to ensure that progress is occurring as specified in the action plan. The Independent Forest Audit reports are published and are available upon request.

Summary of the 2000 Independent Forest Audits

In 2000, Independent Forest Audits were conducted on a total of 18 management units. These included the Brightsand, Dog River-Matawin, English River, Gordon Cosens, Iroquois Falls, Kenogami, Lower Spanish, Upper Spanish, Nakina North, Ogoki, Red Lake, Smooth Rock Falls, and Wabigoon Forests. Also included were four audits of Crown and former Crown management units: Cochrane, Kapuskasing, Moose River, and Spanish River Management Units. As well, there was one audit of a former Company management unit, Iroquois Falls South. These were reported in sixteen audit reports (Nakina North and Ogoki Forests were audited and reported together, as were the Upper and Lower Spanish Forests).

Thirteen of the 16 audit reports in 2000 concluded that the forests are being managed sustainably, two others indicated that the forests are sustainable if certain conditions are met (implementation of recommendations), and one cited difficulty in concluding sustainability due to several recent natural disturbances. In the latter case, the ability of the unit to provide a sustained timber yield, not its ecological sustainability, was questioned.

Thirteen of the audits concluded that management has been performed in general compliance with legislation and policy, or with the principles of sustainable forest management, during the term of the audit. Three audits noted that management would be in general compliance with law and policy provided that solutions to address the recommendations are implemented. Two audits found that management conformed to existing program direction and legislation with significant exceptions.

Eleven audits indicated that the SFL holder had met their obligations and recommended extension of the licence. In three audits, the auditor recommended, "The Minister should extend the Sustainable Forest Licence of the Forest conditional upon the SFL holder making progress to resolve/implement the recommendations of this report for which they are specifically responsible." Licence renewal is not applicable on the four Crown-managed units.

Brightsand Forest

The audit report of the Brightsand Forest, managed by Bowater Pulp and Paper Canada Inc., indicated that the Forest was "...working within an increasingly small window...", with Company performance frequently within the barely acceptable or marginally unacceptable categories during the five-year period ending March 31, 2000. The auditor identified a number of items requiring improvement relative to the management of the unit, resulting in 26 recommendations. Improvements are needed to various aspects of information management and information systems. Bowater Pulp and Paper Canada Inc. is to: track elements of the Brightsand Forest to ensure proper maintenance of inventory information;

report annually on areas where natural renewal is to occur; carry out FTG surveys annually and eliminate the survey backlog; develop and implement procedures for updating, validating and maintaining information systems; develop (with MNR) a monitoring system for timber and non-timber indicators; and establish a program to evaluate and report on all treated areas within three years of harvest. Three recommendations are directed at improving the composition of the LCC. Improvements needed with respect to the Forest Renewal Trust resulted in three recommendations. Bowater Pulp and Paper Canada Inc. and MNR are to review staff workload and consider where additional human resources may be needed, and should also increase their staff presence on the Forest through additional field visits. Bowater Pulp and Paper Canada Inc. and MNR need to develop a strategic action plan, and to define maintenance responsibilities and liabilities for forest access roads. To enhance management of wildlife habitat, Bowater Pulp and Paper Canada Inc. is to initiate operator training on marten habitat requirements, and MNR should continue to monitor woodland caribou numbers, movements, and habitat use. The auditors concluded that if Bowater Pulp and Paper Canada Inc. and the MNR comply with all of the recommendations in the audit, management of the forest will meet the requirements of the CFSA, its implementation manuals, the SFL, and the audit protocol. Licence renewal was recommended, conditional upon Bowater Pulp and Paper Canada Inc. making progress to implement the recommendations for which they are specifically responsible.

Cochrane Management Unit

The audit report of the Cochrane Management Unit, managed by MNR, indicated that, with significant exceptions, management conformed to program direction and legislation during the five-year period ending March 31, 2000. The auditor indicated that managerial and administrative obstacles have hampered the implementation of forest management activities, resulting in poor short-term management of the forest and on-the-ground implementation. The auditor further noted that long-term sustainability will not be jeopardized, provided that the recommendations in the audit report are followed. The audit report identified 16 recommendations for improvement relative to the management of the unit. Some recommendations were aimed at improving forest management practices relating to fish and wildlife habitat. Several recommendations made by the auditor focused on improving the following aspects of forest management plan implementation: skidding practices; appropriate retention of snags and cavity trees; retention of more downed woody debris at the stump; reduction in the area occupied by slash piles; and enhancing the practice and effectiveness of CLAAG. Ministry of Natural Resources is to ensure that all required renewal and maintenance activities, remedial treatments, and surveys are completed as given in the Forest Management Planning Manual. The auditor recommends that MNR proceed immediately to negotiate an SFL for the unit.

Dog River-Matawin Forest

The audit report of the Dog River-Matawin Forest, managed by Bowater Pulp and Paper Canada Inc., indicated that the forest performed satisfactorily and that it was being sustained under the licensee's stewardship during the five-year period ending March 31, 2000. The audit report identified 26 recommendations for improvement by the licensee and MNR relative to the management of the unit. The licensee is to retain the required minimum balance in the Forest Renewal Trust account and the MNR and trustee are to take steps to improve management of the Forest Renewal Trust account for the Dog River-Matawin Forest. Three recommendations address the management of roads on the forest, including a requirement that Bowater Pulp and Paper Canada Inc. and MNR develop a mutually acceptable procedure for identifying and marking road safety hazards in the interests of public safety and environmental integrity. Three recommendations focus on improving information for wildlife habitat management. Bowater Pulp and Paper Canada Inc. is to assess all areas harvested in 1995-2000 to determine if harvested areas have been treated as prescribed and to follow through on outstanding treatments. Bowater Pulp and Paper Canada Inc. is also to set up a program to regularly monitor and assess post-renewal areas. The time expended by the LCC in reviewing administrative amendments to forest management plans should be reduced. Furthermore, MNR staff should not be active members of the LCC. Recommendations direct Bowater Pulp and Paper Canada Inc. and MNR to take steps to improve the quality of annual reports for the Forest. Bowater Pulp and Paper Canada Inc. is to prepare a report comparing planned and actual harvest levels in the current (2000-2005) forest management plan, and identifying surplus areas or volumes for inclusion in the 2001/02 annual report. The auditors conclude that if Bowater Pulp and Paper Canada Inc. and the MNR comply with all of the recommendations in the audit, management of the forest will meet the requirements of the CFSA, its implementation manuals, the SFL, and the audit protocol. Licence renewal was recommended, conditional upon Bowater Pulp and Paper Canada Inc. making progress to resolve/implement the recommendations for which they are specifically responsible.

English River Forest

The audit report of the English River Forest, managed by Bowater Pulp and Paper Canada Inc., indicated that Bowater Pulp and Paper Canada Inc. has managed the Forest in compliance, in all material respects, with the forest management criteria assessed by the audit process during the five-year period ending March 31, 2000. There were no indications that the Forest is not being managed on a sustainable basis. The audit report identified 14 recommendations and six best practices relative to the management of the unit. Ministry of Natural Resources is to review the management of the Forest Renewal Trust to ensure that revenues are posted in time to have month-end balances accurately reflect the funds available for silvicultural expenditures. Where amendments are made to timber management plans or forest management plans, appropriate documentation of amendments should be maintained by Bowater Pulp and Paper Canada Inc. and MNR, and amendment information should be reflected in the comparisons of planned and actual activity levels provided in annual reports. Management of slash piles and chipper debris needs to be improved by the Company and the backlog of this material is to be eliminated. The Company is to improve its planning for renewal by considering the role of natural ingress in renewal planning and by ensuring that road use strategies accommodate required renewal activities. Bowater Pulp and Paper Canada Inc. and MNR need to improve the quality of compliance reporting in annual reports. Bowater Pulp and Paper Canada Inc.'s involvement in a cooperative research project to investigate the effects of habitat change on wildlife populations is an example of the best practices identified. Licence renewal was recommended.

Gordon Cosens Forest

The audit report of the Gordon Cosens Forest, managed by Spruce Falls Inc., indicated that management activities conformed to existing program direction and legislation during the five-year period ending March 31, 2000. The audit team found a well-managed forest, where the licensee has successfully adapted forest management activities to the sensitive nature and site conditions of the area. The forest is being managed sustainably. The audit report identified two recommendations and four best practices. The auditor recommended that MNR must confirm the adequacy of fisheries information on all water bodies where harvest to the water's edge is proposed. The development of methods to reduce roadside slash by at least 50 percent on upland sites is recommended, along with improved procedures to facilitate slash burning. The licensee's commitment to compliance and to continual improvement, reflected in its thorough compliance program and in registration of its environmental management system to ISO 14001, is an example of the best practices identified. This registration of the woodlands division was the first in Ontario. Licence renewal was recommended.

Iroquois Falls Forest

The audit report of the Iroquois Falls Forest, managed by Abitibi-Consolidated Inc., indicated that the Forest was being managed sustainably and in accordance with the applicable requirements during the five-year period ending March 31, 2000. The audit team found the forest to be well-managed. The auditor noted that the licensee had a core of knowledgeable and experienced professional staff as well as a strong working relationship with MNR's Cochrane District. The audit report identified ten recommendations for improvement and three best practices relative to the management of the Forest. The auditor recommended improvements to the documentation of public comments and to the planning for primary access roads. The *Access Roads Manual* must be used to develop road use strategies and to make decisions concerning road abandonment issues, and the nature and presence of values requiring Area of Concern (AOC) protection must be confirmed. Improvements should be made to the content of annual reports and Reports of Past Forest Operations. As required by the SFL, the licensee must develop a Memorandum of Agreement with Grant Forest Products for the provision of poplar fibre. Examples of identified best practices are the active roles the licensee has taken in the Lake Abitibi Model Forest partnership and in incorporating careful logging research findings into on-the-ground operations. Licence renewal was recommended.

Iroquois Falls South Company Management Unit

The audit report of the Iroquois Falls South Company Management Unit, which is managed by Abitibi-Consolidated Inc. and formerly by Abitibi-Consolidated Inc. together with MNR, indicated that management of the unit conformed to requirements and that it was being managed sustainably during the five-year period ending March 31, 2000. The audit team found that the unit was well managed, with evidence that a healthy, productive young forest was growing. The audit report identified 11 recommendations and one best practice relative to the management of the unit. Forest management planning documentation is to be improved with respect to explanation of modeling assumptions, description of the values being protected by AOCs, and confirmation that supplementary documentation corresponds to the text of the forest management plan. Improvements are also needed in the utilization of merchantable timber and in associated inspection report documentation. Abitibi-Consolidated Inc. and overlapping licensees need to review standard operating procedures to ensure that rutting is avoided. Improvements should be made to the preparation and submission of annual reports. As required by the SFL, the licensee must develop a Memorandum of Agreement with Grant Forest Products for the provision of poplar fibre. The high-quality of road and water crossing construction practices carried out by Tembec Industries Inc., an overlapping licensee, was noted as a best practice. Licence renewal was recommended.

Kapuskasing Management Unit

The audit report of the Kapuskasing Management Unit, managed by MNR, indicated that forest management activities on the unit conformed to existing program direction and legislation during the five-year period ending March 31, 2000, and that it is being sustainably managed. The auditor noted that, although some management activities were not completed or were inadequate because of reductions in staff and resources in the mid-1990s, local MNR staff made wise use of the limited resources they had. Forest management activities were in proportion to each other, and staff did a good job of keeping the inventory and database up-to-date. The audit report identified 11 recommendations for improvement relative to the management of the unit. Three recommendations are directed at improving wildlife habitat modeling, planning, and field implementation and monitoring. The auditor noted that these recommendations should receive highest priority. A number of other recommendations are aimed at improving compliance with forest management planning record-keeping and reporting processes. Silvicultural effectiveness monitoring should be included as a component of the monitoring program.

Kenogami Forest

The audit report of the Kenogami Forest, managed by Kimberly-Clark Inc., indicated that the managers of the forest performed very well in meeting their obligations during the five-year period ending March 31, 2000, and that the forest is being sustained. The audit report identified 23 recommendations for improvement by the SFL holder and MNR relative to the management of the unit. The most significant finding dealt with a harvested wood inventory of approximately 1 million cubic metres observed in the forest during the audit. The auditor recommended that this inventory be reduced to approximately 300,000 cubic metres by April 1, 2002. All cut timber should be hauled within a year of harvest, and annual reports should track the level of harvested wood inventories held in the forest. Kimberly-Clark Inc. needs to take more responsibility for compliance monitoring on the forest and the Company and overlapping licensees are to be more diligent in recording and reporting non-compliances to MNR. The MNR should expend greater effort to collect and maintain data on non-timber values such as stream classification, fish and wildlife habitat, and cultural heritage sites. Water crossing installations need to be improved to reduce erosion and sedimentation. Improvements in training and documentation, relative to the delineation and description of AOCs are needed. Ministry of Natural Resources should consult with First Nations in an effort to increase their involvement in LCCs, develop a more consistent methodology for collecting native cultural values, and develop a framework for implementing T&C #77. Greater effort should be made to identify mining claims and to protect known claim stakes. The auditors conclude that if the MNR and the Company comply with all of the recommendations in the audit, the management of the forest will meet the requirements of the CFSA, its implementation manuals, the SFL, and the audit protocol. Licence renewal was recommended, conditional upon Kimberly-Clark Inc. making progress to resolve and/or implement the recommendations for which they are specifically responsible.

Lower Spanish and Upper Spanish Forests

The audit report of the Upper and Lower Spanish Forests, managed by Domtar Inc., indicated that these forests were well managed by the licensee and in compliance with legislation, policies, and other requirements during the five-year period ending March 31, 2000. The management activities were sustainable with respect to harvesting, renewal, protection of other values (such as wildlife and recreation), maintenance of diversity, and socioeconomic values. The audit report identified ten recommendations and six best practices relative to the management of the unit. Four recommendations cover improvements in the planning and inspections of road systems as well as controlling public access to tourism lakes. The audit identified the need to evaluate the effectiveness of reserve widths and permitted activities in protecting AOCs. A recommendation was also directed at improving the tracking and management of unharvested areas remaining after an area has been harvested. Ministry of Natural Resources needs to conduct inspections of renewal activities and surveys as outlined in their Annual Compliance Operations Plan. As well, a recommendation was directed at improving the trustee's management of the Forest Renewal Trust for the Lower Spanish and Upper Spanish Forests. The licensee's preparation of a compliance operating practices manual to provide supplementary guidance for forest compliance management activities was noted as a best practice. Expedited issuance of a licence was recommended for the new Spanish Forest SFL.

Moose River Management Unit

The audit report of the Moose River Management Unit, managed by MNR, indicated that stewardship of the unit has been consistent with the principles of sustainable forest management during the five-year period ending March 31, 2000. The audit report identified 26 recommendations for improvement relative to the management of the unit. The two main issues which arose during the audit were: 1) the unit remains a Crown Management Unit, yet it is being managed by Tembec Industries Inc. without the appropriate legal empowerment for them to do so; and 2) the need for improvement regarding compliance and for a common understanding of compliance issues between the MNR and Tembec Industries Inc. A number of recommendations were aimed at improving various aspects of planning related to long-term access plans, developing meaningful management alternatives, development and use of socio-economic information, timely identification of the planning team, collection of fisheries survey data, development of a mixed-wood strategy, plan documentation, and associated annual reporting. Three recommendations focussed on improving the planning, monitoring, and prevention of site damage on sensitive sites. Improvement of the management and modeling of slash piles, landings, and roads, so that their effects on the productive forest landbase can be minimized and incorporated accurately into wood supply calculations is also needed. Three recommendations focussed on the need to plan and implement a comprehensive silvicultural assessment program. The audit team concluded that a timely resolution of the issue of licence disposition was needed for the unit.

Nakina North and Ogoki Forests

The audit report of the Nakina North and Ogoki Forests, managed by Long Lake Forest Products Inc., indicated that the stewardship of these Forests has been consistent with the principles of sustainable forest management during the five-year period ending March 31, 2000. The audit report identified 25 recommendations for improvement relative to the management of the unit. Continued efforts are needed in working with First Nations to secure their input into the forest management planning process and to resolve issues related to their participation in employment and business development on the Forests. A number of recommendations focussed on improving various aspects of forest management planning including making plan objectives more quantifiable and measurable, examining the rigidity with which the caribou mosaic is applied, and incorporating local input into socio-economic objectives and profiles. There is a need to examine ways to make better use of harvested softwoods so that less is left unprocessed. Several recommendations were directed at the lack of operational supervision that has resulted in less-than-desirable performance in some aspects of harvesting, road construction, and site management. As well, some recommendations were directed at improving the practical application of implementation manuals such as the guidelines for marten. Finally, there is a need to re-negotiate the wood supply commitments contained in the licences for these two Forests and to address the associated violations which have occurred. Licence renewal was recommended.

Red Lake Forest

The audit report of the Red Lake Forest, managed by Red Lake Forest Management Company and formerly by MNR, indicated that the licensee and MNR have managed the Forest in compliance, in all material respects, with the forest management criteria assessed by the audit process, during the five-year period ending March 31, 2000. In relation to forest sustainability, the audit team observed that future wood supply will decrease due to previous natural forest disturbances, as well as the expansion of a provincial park and the exclusion of Crown timber on patent lands from the SFL. The audit report identified nine recommendations and three best practices relative to the management of the unit. Management of AOCs will be improved by ensuring that line markings in the field are consistent with AOC prescriptions, and by providing operators with licences that contain accurate AOC information and mapping. The development of a sustainable forest management policy statement by the Company and implementation of training programs for key activities would enhance the licensee's management of the unit. Improvements in communication and information transfer between the Company and MNR are important to sustainable forest management. It is also very important that the licensee and MNR investigate ways to add new wood supply to the licence to compensate for anticipated future shortfalls. An example of a best practice was the caribou monitoring program carried out by MNR's Red Lake District, which provides necessary information to gauge the effectiveness of woodland caribou management. Licence renewal was recommended.

Smooth Rock Falls Forest

The audit report of the Smooth Rock Falls Forest, managed by Tembec Industries Inc., indicated that, with significant exceptions, forest management activities conformed to existing program direction and legislation during the five-year period ending March 31, 2000. The report concluded the Company's approach to forest renewal must be improved in a timely manner to secure the long-term sustainability of the Forest. The audit report identified 14 recommendations and one best practice. The auditor identified a number of items requiring improvement relative to the management of the unit. Several focus on improving aspects of forest renewal including verifying and adjusting modeling assumptions regarding renewal success rates, applying CLAAG only where it is the most appropriate renewal treatment, putting effective forest operations prescriptions in place, developing a remedial action plan for unsuccessfully regenerated stands, and conducting appropriate FTG surveys by November 2001 to ensure that renewal and maintenance objectives are met. More rigorous application of the moose guidelines during the planning stage is recommended. Future plans should explain how the stick nest habitat of owls and hawks would be protected. In order to reduce the number of infractions, improvement is needed in compliance training, implementation, and monitoring. The best practice identified recognizes the excellent use of temporary bridges. Licence renewal was recommended.

Spanish River Management Unit

The audit report of the Spanish River Management Unit, managed by Northshore Forest Inc. and formerly MNR, indicated that forest management has been undertaken in general compliance with the rules and regulations governing forest management during the five-year period ending March 31, 2000. Activities on the forest were judged to be sustainable with respect to harvesting, renewal, protection of other values (e.g., wildlife, recreation), maintenance of diversity, and socioeconomic values. The audit report identified eight recommendations for improvement of the management of the unit. One recommendation dealt with the operation of the LCC, including the need for MNR to fill vacancies and to improve communications with the committee. Another recommendation identified the need for a clear policy related to how new guidelines are approved and implemented. Three recommendations dealt with the need for improved road maintenance and construction, particularly in relation to water crossings. MNR and the SFL holder were also advised to develop a road use management strategy clearly identifying maintenance and liability responsibilities for road users. The provision of funding at appropriate times for wildlife surveys is also needed. The Spanish River Management Unit no longer exists as a separate entity, but is part of the landbase of the new Northshore Forest; therefore licence renewal was not specifically recommended. The auditor noted, however, that a licence renewal recommendation would be appropriate if the unit was still managed separately.

Wabigoon Forest

The audit report of the Wabigoon Forest, managed by Weyerhaeuser Canada Inc., indicated that the licensee has managed the Forest in compliance, in all material respects, with the forest management criteria assessed by the audit process during the five-year period ending March 31, 2000. There were no indications that the Forest is not being managed on a sustainable basis. The audit report identified 15 recommendations and two best practices relative to the management of the unit. Members of the LCC should be given documentation on plan amendments earlier, and should be encouraged to review annual reports and Reports of Past Forest Operations. The licensee should monitor the work of contractors to ensure that adequate and appropriate snag trees are left for marten habitat. Improvements in management are needed to ensure compliance with the *Environmental Guidelines for Access Roads and Water Crossings*, and to enhance ongoing maintenance of water crossings. To reduce site damage in the forest, the licensee needs to promote the use of different equipment and use more site-specific prescriptions for site preparation. Several recommendations were directed at the need for improved record-keeping in relation to the Annual Work Schedule, forest operation prescriptions, and annual reports. The licensee's commitment to sustainable forest management principles and its widespread internal and external communication of these principles were noted as a best practice. The communications activities include tours and school programs. Licence renewal was recommended.

There are 16 Independent Forest Audits of SFLs planned for 2001: Algoma, Armstrong, Auden, Black River, Black Sturgeon, French-Severn, Lac Seul, Lake Nipigon, Magpie, Nipissing, Pic River Ojibway, ShiningTree, Sioux Lookout, Spruce River, Sudbury, and Wawa Forests. In addition there will be four audits of Crown management units: Bancroft, Minden, Kiashke River, and Temagami. The results of these audits will be published upon completion.

Compliance Monitoring

The forest operations compliance monitoring system in Ontario is designed to ensure that both the MNR and forest industry carry out forest operations according to approved plans and operational standards, and in compliance with legislation. At the management unit level, compliance inspection reports are prepared for harvest, access, renewal, maintenance, and protection operations. These reports assist managers to focus on any activities that may require immediate attention, provide a database for identifying provincial trends, and provide feedback for compliance program adjustment.

Prior to 1998/99, MNR was solely responsible for forest operations compliance throughout Ontario. Effective April 1, 1998, all existing SFL holders assumed lead responsibility for conducting a comprehensive program of forest operations compliance as a condition of their licence. The program includes planning, monitoring, inspection, reporting, training, and education. At this time, the MNR role changed from full inspection to one of monitoring/auditing, conducting "spot-checks" of industry activity, investigation, and enforcement. On the few management units (Crown units) where MNR still conducts forest operations, the MNR remains directly responsible for delivering the compliance program.

The 2000/01 annual report is the third to report the results of "industry self-monitoring and reporting" across the province derived from information largely from a standard electronic format for inspection reporting. Effective April 1, 1998, it became mandatory for all MNR staff to use the Forest Operations Compliance Information System (FOCIS) to complete inspections of Crown units and any "spot-checks" or audits of SFLs, and to submit all inspections to the provincial database, the Compliance Information System (CIS).

Interpreting the data collected through FOCIS and CIS requires experience and understanding of the systems and the "new" roles and responsibilities under the MNR and forest industry partnership. It is expected that several years of electronic data collection is required before statistically confident and consistent information can be reported and analyzed. Compliance reports from 55 forest management units are included in the 2000/01 annual report.

The forest industry (SFL holders) is required to report all incidents of non-compliance on their management unit to the MNR. This includes infractions incurred by the SFL, overlapping licensees, and any private individual who contravenes the CFSA. Incidents related to the latter are not recorded against the SFL i.e., 'non SFL related'. However, the SFL does not have responsibility for assessing the degree of significance of a non-compliance. This is strictly an MNR responsibility.

Ministry of Natural Resources is the regulatory agency with respect to forest operations compliance; MNR "verifies" all instances of non-compliance as reported by companies. Therefore, for each report of non-compliance by industry, there will also be at least one MNR inspection report. For those incidents that are moderate or significant, MNR will actively monitor the non-compliance until it is resolved. This action may result in additional reports of non-compliance by MNR. Also, MNR undertakes random and planned "spot-checks and audits" of forest operations. This may result in additional reports of non-compliance, which may not have been discovered or reported by a company. In some cases, especially those of a minor nature, industry may remedy the situation and deem the infraction too minor to report. As well, some companies may record an incident as "In Compliance With Comments". This category recognizes that a minor situation is present, generally correctable, or there is room for improvement or prevention.

In summary, fundamental differences between the MNR audit and verification role and that of the industry inspection role will lead to differences in the non-compliances reported by MNR and industry, with the total of MNR non-compliant reports generally tending to be greater. Ongoing training of all field inspectors will narrow the gap. Results of both industry and MNR compliance inspections are summarized in Table 10. Table 10 also lists the total number of reports for 1998/99 and 1999/00 for comparison purposes.

Table 10

Forest Operations Compliance Inspection Reports Summary 2000/01

	Industry			MNR					
Operation Type	Total # Reports	Total # Compliant Reports	Total # Non-Compliant Reports	Total Audits, Checks, Verifications	Total # Compliant Reports	Total # Non-Compliant Reports	Significance of Non-Compliant Reports Minor	Mod	Significant
Access	1,316	1,265	51	497	345	152	97	45	10
Harvest	3,910	3,688	222	1,616	1,298	318	228	74	16
Renewal	749	740	9	116	104	12	11	1	0
Maintenance	185	184	1	49	48	1	0	1	0
Protection	1	0	1	2	2	0	0	0	0
00/01 Total Reports	**6,161**	**5,877**	**284**	**2,280**	**1,797**	**483**	**336**	**121**	**26**
99/00 Total Reports	4,859	4,538	321	2,298	1,733	565	388	124	53
98/99 Total Reports	3,166	2,904	262	2,440	1,906	534	383	111	40

Note: The data for each operation type should not be examined in isolation due to the interrelated nature of activities. An inspection is comprehensive in terms of its ability to examine all related activities or sub-activities within the operation.

Joint Inspections/Exchange

Of the total 8,441 inspection reports undertaken across the province, 1,142 were conducted jointly between MNR and Company staff. This activity is encouraged in the first year or two to establish consistency in observations and reporting where new SFLs have been created or where interpretation issues require resolution. It is a requirement that all "in-compliance" inspection reports be exchanged within ten working days of completion of the inspection report. In cases of non-compliance, industry must electronically report these situations within five working days or within 24 hours of the discovery of the violation, if the violation is potentially significant. Similarly, MNR must advise the SFL within the same time periods of any violations that it detects.

Road Washouts

Appendix 20 of the EA Decision requires MNR to report annually on road washouts. Compliance inspections of road water crossings conducted throughout 2000/01 indicate that forest companies reported 17 washouts and eight were identified by the MNR, for a combined total of 25. Washouts can occur due to a number of factors, including natural causes such as flooding and blockage due to beaver activity, and poor road construction techniques.

Actions Taken

In the new compliance partnership model, industry must report non-compliance situations and MNR verifies, assesses the significance, and determines the appropriate remedy and enforcement action if any is required.

In many instances of minor non-compliance, immediate remedial action is undertaken and enforcement measures are not warranted. While the CFSA remedy and enforcement provisions apply largely to licensees of the Crown, any person who contravenes the CFSA may be charged. A total of 48 offence charges were laid under the CFSA to individuals who were unlawfully harvesting forest resources in a Crown forest (see Table 11).

Table 11

Remedy and Enforcement Action Taken (2000/01)

Method	Count	Fine
Administrative Penalty	55	$287,637.77 (To Forest Futures Fund)
Offence Charge	48	$4,958.00 (To general revenue)
Stop Work Order	3	n/a
Repair Order	10	n/a
Compliance Order	19	n/a
Warnings	21	n/a
Investigations (no charges warranted)	3	n/a
Total	**159**	**$292,595.77**

Although all incidents of non-compliance are reported in the fiscal year in which they occurred, a number of cases are ongoing (under investigation or subject to court action) in terms of remedy and enforcement action, and they will be recorded when resolved.

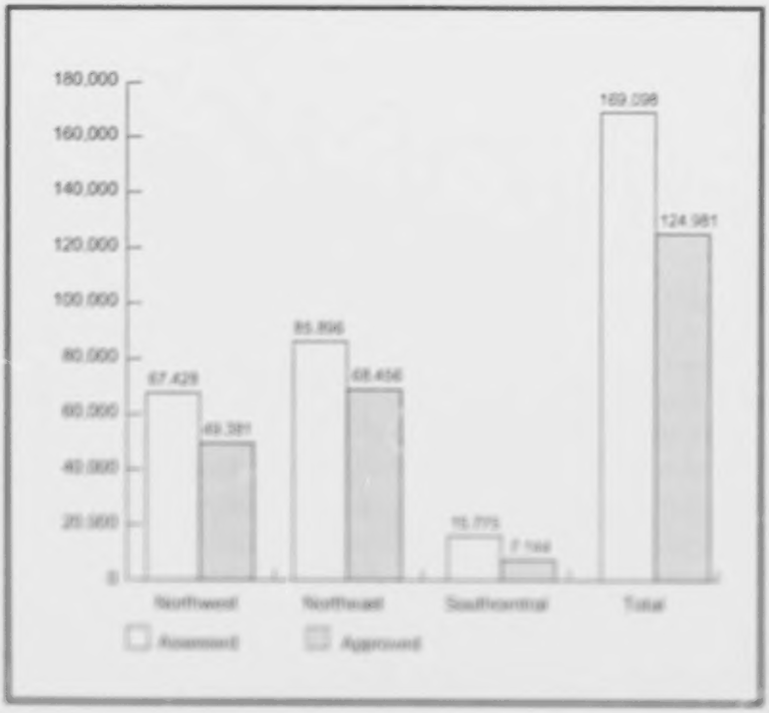
Silvicultural Effectiveness Monitoring

Harvest and renewal activities are reported annually at the time they are implemented. Determination of the success of these activities in regenerating the forest is done by specific assessment methods, which are conducted a number of years (usually 5 to 15 years) after regeneration treatments are completed. Free-to-grow assessments are an effectiveness monitoring tool that provides an indication of the success of the silviculture treatments and information to project the future forest condition. These assessments involve a variety of techniques including field measurement of trees on sample areas of the forest, aerial surveys, and remote sensing. Some forest managers conduct these surveys annually while others prefer to accumulate larger blocks that they assess once every few years. This has resulted in a backlog of areas needing assessment. The Forest Renewal Trust fund now provides funding for these surveys on SFL areas and many forest companies are now assessing their regularly scheduled regeneration as well as the backlog areas.

Figure 26 summarizes the areas assessed and those that were declared FTG for 2000/01 by region for the 44 management units that reported. Of the total area assessed for FTG, 74 percent was approved as having achieved the FTG standard within a set time period. This varies by region, from 80 percent in the Northwest Region and 73 percent in the Northeast Region to 45 percent in the Southcentral Region.

Figure 26

Summary of Area (hectares) Declared Free-To-Grow by MNR Region (2000/01)



There is a noticeable decline in the 2000/01 provincial and regional averages of areas declared FTG. The reasons for the decline vary from region to region. The lowest rate of success is 45%, as recorded for the Southcentral Region, which traditionally reports lower success rates than the two northern regions. The low rate is primarily attributed to the inability to conduct necessary follow-up treatments on stands regenerated in the early 1990's, resulting in forest stands not regenerating to desired species. 2000/01 also saw a much larger area surveyed in Southcentral Region, which subsequently impacts the provincial average. The success rate for the northern regions also dropped somewhat in 2000/01.

Regenerating areas being reported in 2000/01 were harvested and treated several years ago (typically 5 – 15 years), prior to the implementation of the CFSA and the associated Forest Renewal Trust Funds and Forestry Futures Trust Funds. Improvements in the success rates will be apparent in future reports because of these legislative and funding changes for the province. Support from the Forestry Futures Trust Fund and the Forest Renewal Trust Funds provide the funding for forest managers to ensure that harvested areas have the necessary treatments to achieve successful renewal. All harvested areas must be renewed successfully. Some of the areas found not to be classified as FTG at this time will require retreatment and others require tending (i.e. to suppress undesirable competing vegetation such as brush and grass). Other areas will simply require the passage of more time to allow for the incremental growth necessary to meet the height standard for FTG.

Chapter 9

Implementation of Term and Condition #77

Term and Condition #77 of the EA Decision requires the MNR to negotiate with Aboriginal peoples at the local level regarding opportunities for more equal participation in the benefits of forest management. In referring to Aboriginal people, T&C #77 includes communities, individuals, enterprises, and organizations.

The wording of T&C #77 is as follows:

> *"During the term of this approval, MNR district managers shall conduct negotiations at the local level with Aboriginal peoples whose communities are situated in a management unit, in order to identify and implement ways of achieving a more equal participation by Aboriginal peoples in the benefits provided through timber management planning. These negotiations will include but are not limited to the following matters:*
>
> *a) Providing job opportunities and income associated with bush and mill operations in the vicinity of Aboriginal communities.*
>
> *b) Supplying wood to wood processing facilities such as sawmills in Aboriginal communities.*
>
> *c) Facilitation of Aboriginal third party licence negotiations with existing licensees where opportunities exist.*
>
> *d) Providing timber licences to Aboriginal people where unalienated Crown timber exists close to reserves.*
>
> *e) Development of programs to provide jobs, training and income for Aboriginal people in timber management operations through joint projects with the Department of Indian Affairs and Northern Development.*
>
> *f) Other forest resources that may be affected by timber management or which can be addressed in the timber management planning process as provided for in Condition 23(c)."*

Implementation

The scope of T&C #77 is broad, and its application and implementation are determined by variables at the local level. The arrangements and agreements that are effected by MNR district managers and Aboriginal communities take different forms, in an effort to accommodate to the extent possible the unique needs, capacities, and situations of individual Aboriginal communities in the context of available opportunities.

The implementation of T&C #77 may include the involvement of individual Aboriginal communities, or groups of communities, with common interests that are situated in a common geographic area. Linkages with Tribal Councils and regional organization representatives are taken into consideration and encouraged

In its decision, the EA Board ordered MNR to build upon initiatives it was already pursuing and to provide new opportunities for Aboriginal peoples that will enable them to benefit from forest management activities in their local areas.

In January 1996, MNR released a draft version of the *Implementation Guidelines for Term and Condition #77 of the Class Environmental Assessment*. The purpose of these guidelines is:

- to provide MNR district managers with a consistent framework for the implementation of T&C #77 that builds upon existing initiatives and facilitates the development of new initiatives
- to provide Aboriginal communities and forest industry companies with the information MNR district managers will use in the implementation of T&C #77

MNR implements T&C #77 consistent with the CFSA, which provides legislative authority to MNR for the sustainable management and use of forest resources. The CFSA has enabled MNR to put mechanisms in place that may assist in facilitating the implementation of T&C #77.

While responsibility for implementation of T&C #77 rests with MNR, the EA Board recognized that the involvement of other parties would be critical to successful implementation. Such involvement would include the participation of First Nations and other Aboriginal communities, the forest industry, and other government bodies (e.g., Ontario ministries, Department of Indian Affairs and Northern Development Canada, Natural Resources Canada).

Aboriginal participation in forest management and economic development activities is summarized under four categories: access to resources, role in planning and management, silvicultural opportunities, and training and development.

Access to Resources

First Nations are often in a position to operate as forest harvesters. Although Ontario's wood supply is almost completely allocated to SFL holders, MNR has helped the industry and the aboriginal communities negotiate types of access. For example, overlapping licences have been issued to First Nations.

In other examples, First Nations have "first opportunity" to buy in as an independent operator when opportunities arise. The industry has been innovative and willing to consider a variety of means for First Nations to increase their access to forest resources.

Role in Planning and Management

Ontario has increased the role for First Nations through the CFSA. Districts have responded by seeking effective forums for Aboriginal communities to have a greater say in the planning and management of forest resources nearby. It is mandatory for forest management plans to include a detailed Native Background Information Report and Native Values maps. Districts have provided financial assistance to some communities either to prepare these components themselves, or to hire archaeological research contractors.

In some districts, First Nations are represented directly with industry and government on the forest management planning team responsible for the planning decisions for each five-year plan.

Silvicultural Opportunities

Forest renewal offers a long list of operational requirements: growing trees, planting, tending, thinning, spraying, site preparation, and more. Many First Nations have experience in at least some silvicultural activities and district managers have sought specific agreements between industry and First Nations to detail the type and scope of contract work that can be made available on a competitive basis. This work, taken together, can contribute to an effective economic development program.

Training and Employment

Although MNR is not the ministry with a training mandate, district managers have found ways to help coordinate existing federal and provincial programs to assist Aboriginal communities to prepare for increased participation in forest management activities.

On a local level, districts have provided hands-on training for many years through the Native Internship Program and Sault College's Aboriginal Resource Technician Program. The Aviation, Flood and Fire Management Branch of MNR has trained firefighters on several reserves, and prepared them for bidding on contracts.

In some districts, the forest industry provides the training strategy, recruitment and hiring support, and business opportunities for independent contractors. In some instances, MNR is taking the lead to assist in providing the building, equipment, and leadership to establish a training centre for Aboriginal peoples.

In all districts, there have been joint projects with First Nations for many years, with MNR providing the training, funding, facilities, and equipment.

District Progress

Ministry of Natural Resources is required to report on the progress of negotiations under T&C #77 for each district. Of the 26 MNR districts, four are outside the AOU, including Aylmer, Aurora, Cambridge and Midhurst. Part of the AOU extends into Peterborough District but the responsibility for reporting on native negotiations for this area has been assigned to Bancroft District. A more detailed description of benefits provided to Aboriginal communities in each MNR district follows.

Algonquin Park

Management unit: Algonquin Park Forest

There are no First Nations or other Aboriginal communities situated within the Algonquin Park Forest. However, Algonquin Park is part of the traditional territory of several Algonquin communities surrounding the provincial park, including Bancroft, Algonquins of Greater Golden Lake and Area, Mattawa-North Bay, Ottawa, Pikwakanagan (formerly Golden Lake), Sharbot Lake, and Whitney. Portions of the park are also included in the Robinson-Huron Treaty and Williams Treaty areas.

Through a signed Memorandum of Understanding, opportunities were identified for upcoming forestry related contracts. Extensive consultations have occurred with Algonquin communities as part of the implementation of the Memorandum of Understanding. Discussions on opportunities involved harvesting, silvicultural contracting, road maintenance, and construction. Ontario and the federal government are engaged in land claim negotiations with the Algonquins of Ontario.

The Algonquin Forest Authority/MNR offer to sponsor individuals from each community in forestry-related courses. Training sessions are also available from the Algonquin Forestry Authority on topics such as water crossings, tree marking, and careful logging.

Up to 20 Algonquin community members are employed in woodland operations. The Algonquin Forestry Authority has been involved with, and continues to enter into, contractual arrangements for road maintenance and silviculture work with individual Algonquins and with community economic development corporations. Various opportunities have been identified such as supplying tree seedlings from the Corry Lake Tree Nursery (an enterprise of Makwa Economic Development Corporation), quoting on silvicultural jobs, and data collection.

Forest resource allocations of 21,000 cubic metres annually were identified for First Nation utilization, of which 20,000 cubic metres were harvested. In addition, 25 hectares of manual cleaning and 3,300 hectares of tree marking were completed by native contractors and $10,000 of roadwork was completed.

Three seats on the forest management planning team have been allocated to First Nations. The Algonquins of Pikwakanagan and the Mattawa Algonquins are involved in the preparation of future Native Background Information Reports for the Algonquin Park Forest.

Bancroft District

Management units: Bancroft, Mazinaw, and Minden

There are no First Nation communities in the Bancroft District. However, the Algonquin First Nation has satellite communities around the Bancroft, Sharbot Lake, and Whitney areas.

Discussions of potential opportunities have occurred between The Bancroft Minden Forest Company Inc. and several First Nations. There is currently a First Nation representative on the LCC in the Mazinaw-Lanark Management Unit.

The Algonquins of Whitney are members of independent licensees in the Bancroft-Minden SFL and have had a supply agreement to harvest 100 hectares per year that provides an estimated five full time job opportunities. The reported First Nation forestry-related workforce in this district is 13 people.

The Golden Lake First Nation and the Algonquins of Sharbot Lake prepared local Native Background Information Reports. The Algonquins of Golden Lake submitted a proposal for a training initiative that was supported by a local forest company.

Chapleau District

Management units: J. E. Martel Forest, Pineland Forest, and Superior Forest

The Brunswick House, Chapleau Cree, Chapleau Ojibway, and Michipicoten First Nations are the four First Nation communities with a landbase in the Chapleau District. In addition, the Missanabie Cree, Mississaugi First Nations, and Sagamok Anishnabek all have traditional land use areas within the district.

Weyerhaeuser Company in conjunction with MNR has actively participated in discussions with Missanabie Cree First Nation for the last 12 months. The parties are mandated to develop and draft an agreement that would provide Missanabie Cree First Nation with economic development opportunities on the Superior Forest. The First Nation hired an independent consultant and appointed representatives to their First Nation Forestry Team to represent their interests. MNR has assigned a lead negotiator to move the tripartite negotiations forward. Negotiations are advancing well and are expected to continue. Missanabie Cree is seeking access to all aspects of forest operations in this unit. Weyerhaeuser Company has also provided this First Nation with the expertise of a proposal writer to assist them in obtaining funding for their ventures.

Brunswick House First Nation has developed the White Eagle Logging and Trucking Company to supply Domtar Inc. on the J.E. Martel Forest. A wood volume commitment has been negotiated between both parties for the second consecutive year and First Nation members have been provided with direct employment opportunities in harvest operations and access construction. Domtar Inc. has provided First Nation employees of this initiative with on-the-job training to meet provincial standards. This initiative is supported by MNR through tripartite meetings scheduled every six weeks.

Brunswick House First Nation has also maintained ongoing negotiations for wood volume commitments with a Quebec-based harvester operating on private lands in the Chapleau Area.

A Brunswick House First Nation member has also opened a small sawmill that currently processes large diameter conifer and underutilized species made available through local SFL holders. District staff supported this initiative by attending meetings between the parties. This entrepreneur has also accessed Canada Ontario Resource Development Agreement funding to assist in the development of her business.

Seven First Nations in Chapleau District participate in a Communication Protocol Forum to deal with issues including access to resource-based opportunities. Those members actively attending quarterly meetings include representatives from Chapleau Ojibway, Chapleau Cree, Brunswick House, Missanabie Cree, Michipicoten, and Missisaugi First Nations as well as Sagamok Anishnabek.

A number of First Nation members from Chapleau and beyond work in the sawmill and planer operations for both the Domtar Inc. and Weyerhaeuser facilities in Chapleau.

The Chapleau District staff continues to include a Native Resource Technician to liaise with district staff, SFL holders, and First Nation communities.

Cochrane District

Management units: Cochrane, Driftwood Forest, Iroquois Falls Forest, Moose River, Smooth Rock Falls Forest

The eight First Nations in the Cochrane District are Attawapiskat, Fort Albany, Fort Severn, Kashechewan, Mocreebec Indian Government, Moose Cree, New Post, and Weenusk. Wahgoshig First Nation also has overlapping traditional territory in the Cochrane District.

Discussions between First Nations and the forest industry continue successfully. A Working Partnership Agreement signed between Wahgoshig First Nation, New Post First Nation, Abitibi-Consolidated Inc., and MNR has resulted in the establishment of three new working committees. Moose Cree First Nation has begun negotiations with Abitibi-Consolidated Inc. on a Working Partnership Agreement. Ministry of Natural Resources, Tembec Industries Inc., and New Post First Nation are holding meetings related to forest management planning.

employment, education and training opportunities, and economic and community development. Planning continues for a proposed Moose Cree Management Unit under the Northern Boreal Initiative. Ministry of Natural Resources and Tembec Industries Inc. are providing funding for a community liaison officer for planning purposes.

Tembec Industries Inc. allocated harvest volumes to Moose Cree First Nation (85,000 cubic metres), Wahgoshig First Nation (30,000 cubic metres), and New Post First Nation (125,000 cubic metres). An additional allocation of 65,000 cubic metres to New Post and Wahgoshig First Nations was provided from Abitibi-Consolidated Inc.

Norbord Inc. employed a member of the New Post First Nation at their mill in Cochrane. Tembec Industries Inc. hired two summer workers and, partnered with MNR and New Post First Nation, created an additional five summer positions in the Stewardship Ranger Program. Abitibi-Consolidated Inc. employed 11 First Nations persons in forest operations and, with MNR, are funding a liaison position at Wahgoshig First Nation.

Abitibi-Consolidated Inc. and Tembec Industries Inc. have been active in the initiation of training and education programs including provision of Co-op placements. Abitibi-Consolidated Inc. paid for various training and education opportunities for First Nations members including training to drive heavy trucks, culvert installation, forest management, compliance reporting, forest operating standards, youth development, and forestry workshops. Abitibi-Consolidated Inc. has enriched several First Nation communities with assistance in funding for various social events.

Dryden District

Management units: Dryden Forest, English River Forest, and Wabigoon Forest

The two First Nations located in Dryden District are Eagle Lake First Nation and Wabigoon Lake Ojibway Nation. Other First Nation communities with interest or ongoing activities in the district include Grassy Narrows First Nation, Lac Seul First Nation, Saugeen First Nation, Wabaskang First Nation, and Whitefish Bay First Nation. Most of these First Nations were invited to participate in forest management planning for the Wabigoon Forest and the forest management plan information meetings, public review, and notification of approval process for the Dryden Forest.

Noopimiing Anokeewin Inc. under contract harvested 58,923 cubic metres of wood on the Wabigoon Forest and also delivered an additional 1,064 cubic metres of wood from private land. This activity provided full-time employment to an estimated 20 Aboriginal people. At the same time, their total harvest on the Dryden Forest was 13,287 cubic metres. The total annual harvest by Noopimiing Anokeewin Inc. was 72,351 cubic metres in 2000/01 within the Dryden District. In 2000/01 Eagle Lake First Nation harvested 11,807 cubic metres of wood from the Dryden Forest and 10,775 cubic metres from the Wabigoon Forest. This operation provided seasonal employment for 10 to 12 Aboriginal people for eight months. As well, Eagle Lake First Nation delivered an additional 8,047 cubic metres of wood from reserve land, giving a total harvest of 30,629 cubic metres for 2000/01. The Aboriginal Peoples of Wabigoon harvested 30,629 cubic metres of wood from the Dryden Forest.

Weyerhaeuser provided contract opportunities for pre-commercial thinning operations to Wabigoon and Lac Seul First Nations and the Aboriginal People of Wabigoon. A total of 102 hectares was thinned and provided seasonal employment for up to 25 First Nations people. Weyerhaeuser Company Limited purchased 3.1 million seedlings from the Wabigoon First Nation Tree Nursery facility. As a result of discussions, there have been letters of intent signed between Weyerhaeuser Company Limited and First Nations communities for the Wabigoon Forest.

Bowater Pulp and Paper Canada Inc. and Saugeen First Nation have held discussions towards the development of a letter of intent and hopes to outline future opportunities and protocols in the English River Forest.

The Dryden Forest Management Company Ltd. ordered 400,000 seedlings from the Wabigoon First Nation Tree Nursery and signed an agreement to buy 40 percent of its annual requirement from the greenhouse. Noopimiing Anokeewin Inc. received a contract for slash pile burning and road maintenance from Dryden Forest Management Company Ltd. Eagle Lake First Nation signed an overlapping licence agreement with Dryden Forest Management Company Ltd.

Weyerhaeuser Company Limited provided summer employment for one Eagle Lake First Nation student, one Wabigoon First Nation student and two Lac Seul First Nation students. Two youths from Saugeen First Nation participated in an eight week First Nation Ranger Program sponsored by Bowater Pulp and Paper Canada Inc.

Ministry of Natural Resources and the Dryden Forest Management Committee sponsored a student in the Aboriginal Resource Technician program based out of Sault College.

Fort Frances District

Management units: Fort Frances-Flanders Forest, Highrock Forest, and Sapawe Forest

The First Nations located in the Fort Frances District are Couchiching, Lac La Croix, Naicatchewenin, Nicickousemenecaning, Rainy River, Seine River, and Stanjikoming. Big Island, Big Grassy First Nations, and Onegaming are located outside the border of the district but their traditional territories extend into the district.

Discussions with First Nations within the district are at an advanced stage. Three native persons sit on LCCs within the district. Consultations regarding the forest management planning for the new Crossroute Forest are underway and all the native communities within and adjacent to the management unit have been invited to participate. They have been advised of the Native Consultation Process option and of the required native values collection. No interest has been expressed in harvesting or other forestry opportunities for First Nations people on the Sapawe Forest.

Within the Fort Frances-Flanders Forest, a total of nine separate harvesting licences were issued to six different First Nations, with a combined harvest allocation of 214,460 cubic metres. In addition, contracts were issued for two contracts to plant 126,000 trees, a mechanical site preparation contract for 218 hectares, and two contracts for 125 hectares of pre-commercial thinning. Employment estimates for the Fort Frances-Flanders Forest were about 76 First Nations persons. Employment estimates for the Highrock Forest were approximately 91 First Nations persons plus an additional 80 to 90 First Nations mill workers. Within the Highrock Forest, harvest allocations totalled 64,000 cubic metres of wood. Additional contracts for the Highrock Forest included three thinning contracts covering 135 hectares and a $250,000 road maintenance contract.

Ministry of Natural Resources and the Gamongi'ikok Committee of the Naicatchewenin First Nation initiated a draft Terms of Reference which included management planning information and natural resource management for the Loonhaunt Area. Abitibi-Consolidated Inc. and Lac La Croix First Nation continue discussions to implement the

Memorandum of Understanding to establish a joint forest management structure for a designated area of the Fort Frances-Flanders Forest. Abitibi-Consolidated Inc. is working to strengthen their business relationship with Naicatchewenin Development Corporation.

Stanjikoming First Nation was awarded a contract by Abitibi-Consolidated Inc. as a training opportunity to construct approximately 2.5 kilometres of road. Abitibi-Consolidated Inc. employs one individual through the Native Technician Program.

Encouraging discussion continues between MNR, an individual interested in a log home construction business, and an independent sawmill operator.

Hearst District

Management units: Gordon Cosens Forest and Hearst Forest

Constance Lake is the only First Nation in the district, although Hornepayne, Menominee, and New Post First Nations have interests within the district. Constance Lake First Nation, through an affiliate (Mammamatawa Inc.), was issued a yearly allocation of 13,000 cubic metres of wood. Mammamatawa Inc. had additional contracts for roughly 187,000 cubic metres of wood in 2000/01. In addition, they were awarded a tree-planting contract for 0.5 million seedlings. The forest industry has facilitated training and harvesting opportunities for Mammamatawa Inc. on both the Hearst and Gordon Cosens Forests.

Mammamatawa Inc. employs approximately 20 workers full and part time and the workforce at the local Lecours Lumber sawmill is comprised of almost 50 percent First Nations persons. Two other sawmills in the area have initiatives to employ First Nations people. Also, MNR employed two First Nation summer students with part-time winter employment as well.

Constance Lake First Nation has a representative on the Hearst LCC and a representative on the forest management plan team for the Hearst Forest.

Plans include harvesting opportunities north of the AOU and a collaborative effort to build a finger-jointing plant within the district.

Kemptville District

Management unit: Lanark

The Mohawk Council of Ahkwesahsne and the Algonquins of Ottawa and Sharbot Lake hold regular discussions on forest management opportunities. A member representing the Algonquin communities participates on the LCC. There were no contracts, licences, or allocations designated in this district during 2000/01.

The district provided funding to assist two Ahkwesahsne community members to participate in a national round table on forest certification in Saskatoon. The Forest Gene Conservation Committee led a seed collection course and the district provided funding for all Algonquin and Akwesasne participants. The district continues to encourage and support involvement of both First Nations with the SFL holder.

Kenora District

Management units: Kenora Forest and Whiskey Jack Forest

The 12 First Nation communities located in the Kenora District are, Dalles, Grassy Narrows, Iskutewisakaygun, Northwest Angle #33, Northwest Angle #37, Ojibways of Onegaming, Shoal Lake #40, Wabaseemoong, Wabauskang, Washagamis Bay, Wauzhushk Onigum, and Whitefish Bay First Nations. Big Grassy First Nation and Big Island First Nation are located in Fort Frances District but have reserve lands and an interest in resource planning in Kenora District.

All of the First Nations within the district were invited to Public Information Centres for review of the forest management plan for the Kenora Forest. An extra Information Centre was held at Iskutewisakaygun First Nation at the request of the Chief. The Kenora Forest Management Unit Annual Work Schedule was presented to the Chief and council of the Wabaseemoong Independent Nation. A Final Report on the Protection of Identified Native Values, Native Background Information Report, and Values maps were produced for 12 First Nations within the Kenora Forest management unit. There is a First Nation member and a Metis individual on the LCC. Discussions between First Nations and MNR continue with topics including harvest opportunities.

Iskutewisakaygun First Nation was allocated a licence to harvest 2,407 cubic metres per year. Wabaseemoong Independent Nation had an allocation of 7,221 cubic metres per year and harvested 1,143 cubic metres under licence. Nineteen poplar harvest blocks were made available to First Nations for capacity building and training development exercises in the Kenora Forest Management Unit. An FRL was issued to Stanjikoming First Nation and 4,329 cubic metres of wood were harvested, employing four full-time people as part of this capacity building exercise. Contracts were granted for herbicide application that provided 32 person-days of employment to First Nation individuals, pre-commercial thinning (128 person-days) and mechanical cleaning with pre-commercial thinning (198 person-days).

In anticipation of becoming the future SFL holder on the Kenora Forest, Weyerhaeuser Company Limited has negotiated a number of agreements and Memorandums of Understanding with Treaty #3 First Nations. In addition, a number of construction jobs for First Nations people were created when Weyerhaeuser Company Limited purchased the Trus Joist plant site.

Abitibi-Consolidated Inc. supported a student work/study placement through the Sault College Aboriginal Resource Technician Program.

Kirkland Lake District

Management units: Part of Iroquois Falls Forest and Timiskaming Forest

The four First Nation communities with interests in the Kirkland Lake District are Beaverhouse, Matachewan, Temagami, and Wahgoshig.

Discussions continue between First Nations and industry, focused primarily on silvicultural opportunities leading to potential harvesting contracts. The Wahgoshig First Nation and Tembec Industries Inc. have signed a Memorandum of Understanding to establish future business relationships on the Iroquois Falls Forest. Also, Timiskaming Forest Alliance Incorporated (TFAI) and Abitibi-Consolidated Inc. have entered into successful silvicultural contracts with the Wahgoshig and Matachewan First Nations.

A Native Awareness Workshop and Awareness Day were held for MNR, forest industry staff, and First Nations to present native issues and cultural perspectives and to improve communications between all parties. Also, the Beaverhouse Aboriginal Community held an open house to promote relationships between industry and the public.

Matachewan First Nation was issued a tree planting contract from TFAI worth $33,139 and a pre-commercial thinning contract for $93,750. These operations employed ten persons from the native community. Tembec Industries Inc. and Matachewan First Nation operated a horse-logging operation with an allocation of 2,450 cubic metres and employed eight native community members. As well, Matachewan First Nation has a representative on the LCC.

Wahgoshig First Nation and New Post First Nation, in partnership with Abitibi-Consolidated Inc., were allocated a harvest volume of 65,000 cubic metres on the Iroquois Falls Forest. The TFAI contracted tree planting worth $31,877 and pre-commercial thinning valued at $93,759, which employed ten native community members. Wahgoshig Anishinabek Mitik Inc. addresses all aspects of forest management for the Wahgoshig First Nation.

An Aboriginal Resource Technician was sponsored by TFAI and MNR at Sault College. Two summer students were hired through the Experience program by MNR from Matachewan First Nation and one summer student was hired from Wahgoshig First Nation. Ministry of Natural Resources employed a liaison officer from the Matachewan First Nation. Abitibi-Consolidated Inc. has sponsored several training initiatives for First Nations including forest management, A-Z driver's licence, culvert installation, compliance reporting, and a workshop to introduce forest management and planning.

Nipigon District

Management units: Auden Forest, parts of Black Sturgeon Forest, Kenogami Forest, Lakehead Forest, Lake Nipigon Forest, Nakina North Forest, Ogoki Forest, and Pic River Ojibway Forest

The 15 First Nations located in the Nipigon District are Animbiigoo Zaagi'igan Anishinaabek, Aroland, Biinjtiwaabik Zaaging Anishinaabek, Eabametoong, Ginoogaming, Kasabonika Lake, Long Lake #58, Marten Falls, Neskantaga, Nibinamik, Ojibways of the Pic River, Pays Plat, Red Rock, Sand Point, and Webequie First Nations. As well, Constance Lake, Fort William, Gull Bay, and Whitesand First Nations have traditional lands within Nipigon District.

Animbiigoo Zaagi'igan Anishinaabek continued their participation on the Lake Nipigon Forest planning team through the hiring of a consultant. A member of the community was nominated to sit on the

Nipigon East Area LCC. This First Nation completed a tree plant of 50,000 trees as well as manual tending and pre-commercial thinning operations on the Auden Forest. Animbiigoo Zaagi'igan Anishinaabek are expected to begin harvest operations in 2001/02.

Aroland, Eabametoong, and Marten Falls First Nations are involved in advanced discussions regarding harvesting, planting, and site preparation opportunities in the Nakina North and Ogoki Forests. Each of the three First Nations has representation on the Three Nations Management Inc. (TNMI) Board of Directors. The General Manager of the TNMI will act as First Nations representative on the 2003 Forest Management Planning Team for the Ogoki Forest. Aroland First Nation has been issued an overlapping license to harvest 45,250 cubic metres of conifer from the Nakina North Forest and 1,656 cubic metres from the Kenogami Forest. Eabametoong First Nation has a harvesting allocation of 80,500 cubic metres of conifer from the Ogoki Forest. Marten Falls First Nation also has a harvest allocation of 80,500 cubic metres of conifer from the Ogoki Forest. One harvesting contractor from Aroland First Nation was hired by Dew North Explorations as well as many tree planters from that native community. Residents are also employed in the Kimberly Clark Woodlands. Aroland First Nation community members are participating in the collection of First Nation Values for the Kenogami Forest and have selected a representative for the collection of data for the 2003 Ogoki Forest Management Plan.

Biinjtiwaabik Zaaging Anishinaabek had representation on the Black Sturgeon Forest management planning team and an information centre was held in the community. Biinjtiwaabik Zaaging Anishinaabek continued their participation on the Lake Nipigon Forest planning team through the hiring of a consultant. A Protocol of Cooperation was reached with Domtar Inc. Harvest allocations were 51,000 cubic metres on Lake Nipigon Forest. A one-year Memorandum of Agreement was signed for the Black Sturgeon Forest outlining the relationship and identifying potential opportunities. A contractor from this native community completed a spacing contract on the Black Sturgeon Forest. The First Nation completed a tree plant of 50,000 trees and a pre-commercial thinning project on the Lake Nipigon Forest.

Ginoogaming First Nation had community members working at Long Lake Forest Products Mill. Residents are also employed in the Kimberly Clark Inc. woodlands. Ginoogaming community members are participating in the collection of First Nation Values for the Kenogami Forest.

Gull Bay First Nation contractors completed contracts for Bowater Pulp and Paper Canada Inc. for tree planting, site preparation, cone collection, spraying, and spacing projects. Bowater Pulp and Paper Canada Inc. assisted the First Nation in securing funding for a community strategic planning process.

Long Lake #58 First Nation community members are participating in the collection of First Nation Values for the Kenogami Forest. Residents are also employed in the Kimberly Clark Woodlands.

Ojibways of Pic River First Nation has a Development Corporation with a Manager of Operations who participates as a member of both the planning team and LCC for the Pic River Ojibway Forest. The Pic River Development Corporation (PRDC), with its overlapping FRL, is in advanced discussions with Great West Timber Limited regarding wood supply, silviculture, licence volumes, and job creation. Their wood allocation volume is estimated at 109,965 cubic metres per year. The PRDC completed a tree plant of 125,000 trees. In addition, Ojibways of Pic River First Nation had ten contract fire crews that were successfully employed by MNR.

Pays Plat First Nation participated in the First Nations Consultation Program for the 2001 Forest Management Plan for the Lake Nipigon Forest.

Red Rock First Nation has an active member on the Lake Nipigon West Area LCC and continues to participate in the 2001 Lake Nipigon Forest Management Planning Team. A consultant is representing the Red Rock First Nation on the Lakehead Forest Management Planning Team and negotiations continue for identification of harvest areas. Red Rock First Nation has a yearly harvest allocation of 51,000 cubic metres from the Lake Nipigon Forest, of which 29,290 cubic metres were harvested employing 30 local residents, and additional harvest volumes through a cutting contract with Weyerhaeuser Company Limited. Negotiations continue with Greenmantle Forest Inc. for a 25 hectare licence to harvest on the Lakehead Forest.

Kimberly-Clark Inc., Longlac Wood Industries Inc., Columbia Forest Products, and Lecours Lumber Co. Ltd. made available silvicultural contracts, which included thinning, tree planting, FTG assessments, nursery stock production, and cone collection in the Kenogami Forest. Kimberly-Clark Inc. directly employs First Nations people within its operations. Domtar Inc. offers additional silvicultural contracts in the

Lake Nipigon and Auden Forests. Niigaani Enterprises is a native-owned logging company which harvested wood on the Black Sturgeon Forest under an overlapping FRL. Whitesand First Nation completed a planting contract in the Black Sturgeon Forest.

North Bay District

Management units: Nipissing Forest and Temagami

The five First Nation communities located within North Bay District are Antoine Algonquin First Nation, Dokis First Nation, Mattawa North Bay Algonquins, Nipissing First Nation, and Temagami First Nation.

Numerous sessions surrounding resource and economic issues and training took place in 2000/01 and discussions regarding forestry opportunities are at an advanced stage. Opportunities for various different forestry training opportunities have been offered to all five communities sponsored by the MNR District and one workshop sponsored by the Canadian Institute of Forestry.

The Temagami First Nation was allocated 21,736 cubic metres of wood in the Temagami Management Unit. They also completed 278 hectares of tending and 264 hectares of pre-commercial thinning. Funding was secured up to the end of the second year of a three-year pre-commercial thinning project, which is worth an estimated total of $720,000. Manual tending of 96 hectares for Grant Forest Products was worth $33,600.

Nipissing First Nation was involved in extensive work on a forest management plan for the reserve land and was assisted by MNR and Nipissing Forest Resources Management Inc. Nipissing First Nation was also involved in road building activities.

Work by Dokis First Nation centred on the approval process for the installation of a bridge to allow access to available harvest area. Nipissing Forest Resources and Tembec Industries Inc. worked closely with Dokis First Nation on their five-year allocation of 17,544 cubic metres of wood and provided a Registered Professional Forester one day per week. Much time was spent by Dokis First Nation in the preparatory work for a forest management plan for their reserve lands.

The Mattawa North Bay Algonquins continued operations on their wood allocation of 15,000 cubic metres. There were up to 15 First Nations people involved in bush operations. A private Aboriginal contractor also employed two First Nations people on a tree plant crew which planted

700,000 trees. One Mattawa North Bay Algonquin member was trained in tree marking.

The Antoine Algonquin First Nation is proposing a sugar bush development in 2002 and the outlook is favourable.

District funds made available for aboriginal forestry related opportunities amounted to about $240,000 in 2000/01.

Parry Sound District

Management unit: French-Severn Forest

The six First Nations located in the Parry Sound District are Henvey Inlet, Magnetawan, Moose Deer Point, Shawanaga, Wahta Mohawks, and Wasauksing. As well, Dokis First Nation adjacent to the French-Severn Forest is active in forest management in the district.

A District Native Liaison Officer communicates regularly with the First Nations communities. The First Nations were contacted by the district as part of the Annual Work Schedule review. Henvey Inlet, Dokis, Magnetawan, and Shawanaga First Nations have completed Native Values Background Reports.

Limited Crown resources as well as ongoing land claims and full license allocations provide few Aboriginal opportunities within the district, although negotiations have been initiated to allocate a small surplus of timber. A portion of this allocation was successfully allocated but not licenced to the Dokis First Nation. The Dokis, Henvey Inlet, and Magnetawan First Nations had silvicultural contracts with the SFL for brush saw work valued at $51,900, $8,400, and $12,600, respectively.

Shawanaga First Nation has been an active member on the LCC. As well, Shawanaga First Nation has a technician who is assisting the MNR with bear population surveys and three members of the First Nation were contracted by MNR for the Emergency Deer Feeding Program. A forest technician was trained and hired from the Henvey Inlet First Nation with partial funding for the position provided by the SFL and the federal government. The SFL and MNR assisted in further training and development of this position.

Discussions continue to identify future opportunities in the forestry sector for the First Nations within this district, including training and development.

Pembroke District

Management unit: Ottawa Valley Forest

The district is in advanced discussions with the Algonquins of Pikwakanagan, Algonquins of Greater Golden Lake and Area, and the Mattawa-North Bay Algonquins. Discussions have resulted in the completion of Native Values maps and background reports representing three communities and identifying issues and opportunities requiring further work and discussion.

The Algonquins of Pikwakanagan, through an affiliated company (Makwa Community Development Corporation Inc.), have maintained an overlapping FRL licence and been an associate partner on the SFL since 1996. Results of negotiations have led to contracts for production of nursery stock, data collection, stand improvement, manual cleaning, and forest compliance. An additional benefit of these contracts includes the employment of persons from the Greater Golden Lake Region. The harvest allocation to the Algonquins of Pikwakanagan was 13,140 cubic metres.

Randy Commanda Forestry Services and Kakina Forestry and Consulting Services are the primary Aboriginal businesses that are involved with forestry operations on the Ottawa Valley Forest. Makwa Community Development Corporation Inc. administers both the timber allocations and the Corry Lake Tree Nursery, which is contracted to supply bare root nursery stock to Ottawa Valley Forest. Randy Commanda Forestry Services harvested 9,437 cubic metres under contract, which included road construction and stand improvement. They also completed 400 hectares of tree marking in partnership with Reserve Forestry and Guiding. Kakina Forestry and Consulting Services were contracted for manual cleaning on 45 hectares, conducted post-cut surveys and regeneration assessments on 8,000 hectares, and performed forest compliance on 55 hectares. It is estimated that 30 Aboriginal persons were directly employed in the forest sector in the Pembroke District.

Ottawa Valley Forest Inc., which represents 12 member companies, has been in advanced discussions with Aboriginal communities and has identified potential opportunities including silvicultural contracts for harvest prescriptions, layout, tree marking, stand improvement, tending, pruning, data collection, production of nursery stock, and training and development.

Ottawa Valley Forest Inc. has conducted fire training for six Aboriginal forest workers and staff members have delivered tree marking courses for Aboriginal people. Three of the Algonquin forestry workers regularly attended these workshops, including compliance and silvicultural training as well as a workshop on water-crossings. Ottawa Valley Forest Inc. has also endorsed Aboriginal requests for funds to conduct education/training development.

Red Lake District

Management units: Red Lake Forest, Trout Lake Forest, and Whiskey Jack Forest (Management for the Whiskey Jack Forest is administrated by Kenora District)

There are seven First Nations communities located within the Red Lake District including Deer Lake, Kee-Way-Win, MacDowell Lake, North Spirit Lake, Pikangikum, Poplar Hill, and Sandy Lake. Cat Lake, Grassy Narrows, Lac Seul, Slate Falls, and Wabaskang First Nations also carry out operations within their traditional use areas in the district. Aboriginal people living off-reserve in the community of Red Lake are involved in active discussions about economic development opportunities in the forest sector. None of the seven communities is located within district forest management units.

The Pikangikum First Nation has met regularly with the MNR and the local forest companies regarding proposed changes to the Red Lake Forest Management Unit. Discussions are ongoing regarding ventures for this First Nation under the Northern Boreal Initiative. Discussions are also active between Sandy Lake First Nation and MNR with regard to the establishment of a sawmill operation. Cat Lake First Nation met with the district in relation to access roads and potential employment opportunities.

Weyerhaeuser Company Limited has met with Cat Lake First Nation regarding long-term economic and access potential through the Trout Lake Forest. Weyerhaeuser Company Limited met with Lac Seul First Nation to discuss silvicultural contracts and purchasing wood from the Wabigoon Forest. Other silvicultural opportunities have been offered to other local communities.

One contract was issued to a local First Nation individual for the collection of Native Values in the Red Lake Forest. An estimated 46 Aboriginal people work in saw mills and bush operations in the Red Lake District.

MNR conducted a training session for five students from Pikangikum First Nation to introduce forest management and Geographic Information Systems (GIS) technology. Other Pikangikum students were involved in data collection for the Northern Boreal Initiative.

Sault Ste. Marie District

Management units: Algoma Forest and Northshore Forest

The First Nations within the Sault Ste. Marie District are the Garden River, Mississauga, Ojibways of Batchewana, Serpent River, and Thessalon.

Consultation progresses with the invitation to First Nations communities to participate in MNR's District Aboriginal Strategy. Further, the District has requested First Nations to clarify the status of their current forestry programs and their interest in non-timber forest products.

The Robinson-Huron Forestry Company was granted a total allocation of 1,517 cubic metres. An allocation of wood was made available to Garden River First Nation. On the Northshore Forest, the North Shore Tribal Council was contracted for 200 hectalitres of cone collection, regeneration assessment of 1,000 hectares, and cruising of 500 plots. Mississauga First Nation was awarded a tree planting contract for 100,000 trees and a manual cleaning contract for 60 hectares. Mississauga First Nation was also contracted by MNR for road maintenance and 16 kilometres of road brushing. Sagamok Anishnawek First Nation was awarded contracts for 21 hectares of manual cleaning, 51 hectares of spacing, 50 hectalitres of cone collection, and the planting of 326,643 trees.

Domtar Inc. provided tree-marking training and participated in the Aboriginal Resource Technician Program. Clergue Forest Management Inc. provided forest planning training and participated in the Sault College Aboriginal Resource Technician Program. They also assisted in the forest management plan for the Batchewana First Nation.

Discussions are continuing between MNR and Mississauga First Nation regarding a sunken log venture, wood supply, and a Native Values Protocol, as well as assisting in the development of the Aboriginal Conservation Officer Program. Two Co-op students, one from Mississauga First Nation and one from Garden River First Nation, were placed by MNR. Ministry of Natural Resources assisted in funding a Forestry Business Plan for the North Shore Tribal Council.

Sioux Lookout District

Management units: Caribou Forest, Lac Seul Forest, and Sioux Lookout Forest

There are 14 First Nations communities located in the Sioux Lookout District, of which five, Cat Lake, Lac Seul, Mishkeegogamang, New Slate Falls, and Ojibway Nation of the Saugeen Band, are affected by forest management activities.

Forest management planning for the Lac Seul and Sioux Lookout Forests continues with input from the three communities of New Slate Falls, Cat Lake, and Lac Seul. An Information Centre was held in the community of New Slate Falls in May 2000, with good attendance and input from community members; a number of new values were identified. Negotiations continue between New Slate Falls and McKenzie Forest Products Inc., regarding harvesting, road construction, and maintenance opportunities.

Lac Seul First Nation has a wood supply allocation that has not been pursued due to access concerns. As well, they have a harvesting contract with McKenzie Forest Products. Lac Seul First Nation and McKenzie Forest Products continue to negotiate a Forest Operations Agreement. An estimated 60 First Nations people are employed in mill and bush operations.

Forest management planning for the Caribou Forest also continues with input from Mishkeegogamang and the Ojibway Nation of the Saugeen Band. Mishkeegogamang has a member sitting on the planning team. Mishkeegogamang also started a Values collection exercise late in 2000, which will be helpful in the development of the forest management plan.

The district is involved in the Northern Boreal Initiative. Slate Falls and Cat Lake First Nations have expressed interest in the project and discussions are in the initial stages and proceeding well. The two First Nations have formed a partnership and will be assisted by Windigo Tribal Council. During 2000/01, a Statement of Intent was prepared by all parties to work on this initiative, with letters of support from both First Nation communities.

Sudbury District

Management units: Part of the Northshore Forest, Spanish Forest, and Sudbury Forest

The ten First Nations within Sudbury District are M'Chigneeg, Ojibways of Sucker Creek, Sagamok Anishnawbek, Sheguiandah, Sheshegwaning, Wahnapitae, Wauwauskinga, Whitefish Lake, Wikwemikong, and Zhiibaahaasing. Adjacent communities of Henvey Inlet and Dokis First Nations are active in the district.

Discussions within this district are at varying levels. Industry and First Nations continue to meet to identify and negotiate opportunities.

Sagamok Anishinabek First Nation was granted a four-year FRL with a yearly harvest allocation of 36,000 cubic metres and an additional one-year licence for 10,100 cubic metres on the Northshore Forest. The Northshore Forest also granted a four-year FRL to the ten First Nations within the district with a yearly harvest allocation of 48,896 cubic metres and an additional one-year licence for 6,650 cubic metres. There was an extension on the salvage licence of Wikwemikong First Nation for 1,200 hectares on the Spanish Forest. An overlapping FRL was issued to N'Swakamok, a coalition of five First Nation communities (Dokis, Henvey Inlet, Wahnapitae, Wikwemikong, and Whitefish Lake First Nations) for 42,800 cubic metres.

Sagamok Anishnawek First Nation was awarded contracts for 21 hectares of manual cleaning, 51 hectares of spacing, 50 hectalitres of cone collection, and planting of 326,643 trees on the Northshore Forest. A Wikwemikong First Nation contractor was awarded a contract for 348 hectares of pre-commercial thinning on the Spanish Forest. Wikwemikong First Nation was contracted for a tree plant of 546,000 trees on the Sudbury Forest. Dokis and Henvey Inlet First Nations were contracted to carry out manual tending of 35.6 hectares and 54.9 hectares, respectively, on the Sudbury Forest. As well, Henvey Inlet First Nation completed regeneration assessments on 289 hectares. Cone collection of 60 hectalitres was fulfilled by Whitefish Lake First Nation.

One individual from Wikwemikong First Nation attended a tree-marking certification course offered by MNR. The district also hired an Aboriginal Technician from Wahnapitae First Nation for 28 weeks and provided short-term employment for two individuals from both the M'Chigeeng and Wikwemikong First Nations. Domtar Inc. also offered two short-term positions to two individuals from Wikwemikong First

Nation. An MNR biologist was made available to all ten First Nations for five months. M'Chigeeng First Nation, the United Chiefs of Manitoulin, and MNR worked jointly to locate and facilitate the collection of traditional herbal medicines on the Northshore Forest.

Thunder Bay District

Management units: Armstrong Forest, Black Sturgeon Forest, Brightsand Forest, Dog River-Matawin Forest, Kiashke River, Lakehead Forest, and Spruce River Forest

The four First Nations located within Thunder Bay District are Fort William, Gull Bay, Lac Des Mille Lacs, and Whitesand. In addition, Thunder Bay District has been consulting with a number of Aboriginal communities and Metis organizations.

Whitesand First Nation is a member of the forest management planning team for the Armstrong Forest. Regular community meetings were held with Whitesand First Nation and the community of Namaygoosisagagun as part of the native consultation process. As well, Whitesand First Nation and MNR have signed a Memorandum of Agreement to promote protection of values, harvest and silviculture opportunities, and training. Discussions continue with Namaygoosisagagun, MNR, and Domtar Inc. regarding various economic opportunities.

Bowater Pulp and Paper Canada Inc. and Fort William First Nation continue discussions regarding business opportunities. Abitibi-Consolidated Inc. and Niigaani Enterprises also continue discussions and new harvest allocations have been determined in the new 2001 Spruce River Forest Management Plan.

Red Rock Indian Band and Fort William First Nation are members of the Lakehead Forest Management Planning Team. Fort William First Nation continues negotiations for membership on Greenmantle Forest Inc.

Whitesand First Nation had an allocation to harvest 166,874 cubic metres of wood. Other contracts were provided for tree planting, site preparation, pre-commercial thinning, and regeneration surveys. There are 16 local residents employed by Whitesand Forestry.

Two members of the Namaygoosisagagun community had silvicultural contracts with Buchanan Forest Products.

Niigaani Enterprises from Gull Bay First Nation had a harvest allocation of 17,924 cubic metres on the Spruce River Forest and 283,600 cubic metres on the Black Sturgeon Forest.

Red Rock First Nation was under contract with MNR to complete their Native Background Information Report and Native Values mapping for the Lakehead Forest Management Plan. Discussions were also held with the Fort William First Nation regarding preparation of their Native Background Information Report and Native Values mapping for the Lakehead Forest Management Plan.

Timmins District

Management units: Romeo Malette Forest, ShiningTree Forest, Timmins Forest, Timmins Management Unit, and portions of Pineland and Spanish Forests

Mattagami is the only First Nation in the district. Flying Post Reserve is also within the Timmins District boundary but all residents live off the reserve, mainly in Nipigon. Other interested First Nations include Matachewan, New Post, Sagamok, Wahgoshig, Wahnapitae, and White Fish.

Mattagami First Nation currently has an active member on the forest management planning team for the ShiningTree and Romeo Malette 2001 Forest Management Plans and the Matachewan First Nation has a member on the Timmins 2001 forest management planning team. A letter of support was provided by MNR for Mattagami First Nation to secure funding for training in forestry operations.

Discussions continue regarding opportunities with the Mattagami First Nation as part of the Domtar Inc. First Nation Development Policy for ShiningTree Forest Inc. Domtar Inc. is running the Strategic Forest Management Model (SFMM) for the Mattagami Reserve lands to assist with native forest management planning needs. Domtar Inc. and Tembec Industries Inc. have held cultural awareness training sessions for its employees. No harvesting licences or allocations were issued for 2000/01. A letter of support for Mattagami First Nation was provided from Tembec Industries Inc. and Domtar Inc. promising future allocation. A pre-commercial thinning contract for 110 hectares was offered to Matachewan First Nation prior to being accepted by the Wahgoshig First Nation.

The MNR district co-sponsored three Co-op students in the Aboriginal Technician Program from Sault College and hired three summer forest technicians from the Mattagami First Nation. Tembec Industries Inc. supplied a 5,000 cubic metre training block in the Romeo Malette Forest for eight students from Mattagami First Nation enrolled in a Mechanical Harvesting Certificate Course from College Boreal. Domtar Inc. and MNR participated in a career development day at Mattagami First Nation.

Discussions are also underway with Mattagami First Nation regarding other relevant resource issues including trap-lines, nuisance beavers, and the establishment of a trapper's council. Plans continue for a joint cross-cultural workshop for next year.

Wawa District

Management units: Big Pic Forest, Black River Forest, Magpie Forest, Nagagami Forest, Wawa Forest and White River Forest

The three First Nations located in the Wawa District are Hornepayne, Michipicoten, and Pic Mobert. Pic River First Nation is located adjacent to Wawa District but within the Big Pic Forest. To date, favourable discussions regarding the District Condition 77 Strategy have occurred with Michipicoten, Pic Mobert, and Pic River First Nations.

Michipicoten First Nation has seven members employed in the forestry sector. In co-operation with MNR, the Michipicoten First Nation is planning a non-timber products workshop.

Pic Mobert First Nation has actively participated in forest management planning activities within the district and has an FRL of greater than 100 hectares in the White River Forest. The Pic Mobert Band had a contract with Domtar Inc. for pre-commercial thinning and planting of 200,000 trees.

Pic River First Nation, through the Pic Heron Bay Development Corporation, was allocated an FRL on the Black River Forest totalling 16,870 cubic metres and an additional 16,870 cubic metres on the Big Pic Forest. The Pic River First Nation has 25 members working in the forestry sector.

Hornepayne First Nation has an estimated 32 members employed in the forestry sector.

Chapter 10

Ongoing Development and Future Directions

Ministry of Natural Resources keeps pace with the constantly expanding knowledge base for sustainable forest management through scientific research, technical development, and policy development programs. These programs span a wide range of subjects including: the development of better data and information sources; the creation and implementation of new policies, procedures, and guidelines for forest management planning; the development of new forest management methods, models, and tools; and, continuing long-term monitoring programs and scientific studies.

This chapter outlines the progress MNR has made, in cooperation with its partners, on specific scientific, technical, and policy development programs up to, and including, 2000/01.

New and Improved Data and Information Sources

Term and Condition #81 (T&C # 81)

Provincial Wildlife Population Monitoring

Term and Condition 81 of the EA Decision was initiated in 1995 through partnerships with other monitoring agencies. In 1996, MNR established the Wildlife Assessment Program, involving the staffing of three locations in North Bay, Timmins, and Thunder Bay.

The Wildlife Assessment Program, under the direction of the Provincial Terrestrial Assessment Program, continued the monitoring partnerships with external parties and continued with the implementation of its monitoring approach for the AOU during 2000/01.

Monitoring partnerships included continuing support for Bird Studies Canada to monitor forest bird migration, owls, and red-shouldered hawks, as well as supporting the University of Guelph in its ongoing small mammal monitoring in Algonquin Park. To implement AOU-wide monitoring for small mammals, forest birds and amphibians, the Wildlife Assessment Program continued the establishment of a network of randomly-selected, geographically-distributed permanent sample sites that are representative of major forest types. Studies for testing monitoring protocols continue to occur at these sample sites for these species at limited levels. The forest bird survey partnership with the Canadian Wildlife Service continued and furbearer monitoring through mail surveys to trappers was also continued.

Term and Condition #96 (T&C #96)

Silvicultural Effectiveness

In 2000/01, work continued on the draft *Silvicultural Effectiveness Monitoring Manual for Ontario*. The draft manual describes Ontario's requirements for silvicultural effectiveness monitoring. It will provide consistency on how the information will be reported and analyzed to determine if management activities are producing the expected results. Consistent definitions and standards ensure that the results from forest management activities on similar sites and forest conditions are comparable between stands and between management units across the province.

Work has also continued on survey methodologies used to collect silvicultural effectiveness information. In particular, the Silvicultural Treatment, Assessment, and Reporting System (STARS) is a computer-based, data collection and analysis system designed to simplify silvicultural effectiveness monitoring. As well, refinement continues of the *Free Growing Regeneration Assessment Manual* which provides a regeneration assessment system intended for application to all species and stands managed under the clearcut silvicultural system. These systems, when fully developed, will be used by MNR to substantiate their "spot check" information and by Independent Forest Auditors to conduct their field assessments of regeneration.

Term and Condition #97 (T&C #97)

Forest Ecosystem Classification Program

Forest Ecosystem Classification in Ontario was integrated into the broader provincial ELC Program, which is mandated with the establishment of a comprehensive and consistent province-wide framework for ecosystem description, inventory, and interpretation. The ELC is required to address a full range of scales from ecoregionalization to site/community level. The combination of consistent classification and ecosystem-based inventory tools is pivotal to the achievement of MNR's objectives for ecologically sustainable resource management. The ELC is intended to provide a common language and information framework for planning, management, and monitoring. The current mandate is derived from legal requirements of the EA Decision, as well as the need for ecologically-based planning and reporting at various scales.

Traditional forest inventory is focused on commercial species without an ecological context. Current work in the ELC is intended to facilitate a shift to a comprehensive, multi-scaled ecological inventory in which traditional forest inventory information is embedded.

During 2000/01, ELC sampling continued in the southern portion of the province. This fourth year of comprehensive data collection brings the southern data set to approximately 1,400 plots. Data collection was also continued in the far northern portion of the province. Reconnaissance and preliminary data were gathered in the vicinity of Pikangikum/Berens River in northwestern Ontario.

The first approximation of the ELC for southern Ontario, published last year, has been reprinted twice due to popular demand.

Training courses in the use of the ELC were offered in all parts of the province. Instruction was provided to a wide array of natural resources professionals, non-government organizations, First Nations, forest industry, and partner organizations. A comprehensive training manual and CD training package have been prepared for the southern Ontario ELC.

Work is ongoing on various aspects of integrated inventory approaches, based on a comprehensive training manual for photo-interpretation and inventory published for the Northwest ELC. Substantial portions of Northwestern Ontario continue to be mapped.

Using both the ELC classification approaches and the new ELC-based inventory, draft definitions were developed for old growth forest conditions in Ontario, and circulated for technical review.

Additional ELC-based interpretations dealing with non-timber forest products, intensive forest management, and forest management planning continue to be developed.

During 1999/00, the ELC program undertook a full conceptual and technical review. A revised system architecture and technical standards were completed during 2000/01. Presented at a multi-constituent workshop in January 2001, the revised architecture for the ELC was endorsed for completion. Pending funding and approval to proceed, future work will focus on completion of core classification products based on the revised provincial classification architecture, developing spatial technologies for ecosystem inventory at various scales, and providing practical management applications of the ELC for management planning processes through the development of interpretive tools.

Term and Condition #99 (T&C #99)

Areas of Natural and Scientific Interest (ANSIs)

Areas of Natural and Scientific Interest are areas of land and water containing natural landscapes or features that have been identified by MNR as needing protection of such values as natural heritage appreciation, scientific study, or education. They are classified as either life science, earth science, or combined, and are protected during forest management planning through the AOC process.

During 2000/01, implementation of *Ontario's Living Legacy Land Use Strategy* was the primary focus of protected area efforts. In particular, finalization of site boundaries in preparation for the regulation process will continue to be a major task until all sites are regulated.

The approach that was begun in 1999/2000 to deal with remaining life science and earth science representation gaps under the mandate of the *Ontario Forest Accord* was further developed and enhanced in 2000/01. Development was also started on approaches for representation requirements north of the AOU.

Life Science

Life science inventories were started in several of the new protected areas confirmed through the OLL planning process in preparation for the development of plans for these sites. These inventories varied in scope from reconnaissance to detailed.

A review of the life science representation requirements in ecodistrict 6E-15 (Prince Edward Point/Bay of Quinte area) was completed.

Conservation land securements continued to be achieved through a partnership with the Nature Conservancy of Canada, utilizing various mechanisms (purchases, donations, conservation easements). These securements were concentrated in the southern part of Ontario (mainly, but not exclusively, within ecoregions 6E and 7E). Ministry of Natural Resources participation with partners from Michigan, Wisconsin, Minnesota, Manitoba, and Ontario in an ecoregional planning project for the Superior Mixed Forest Ecoregion (including ecoregions 4W and 5S in Ontario) continued.

Earth Science

The main focus of the earth science conservation program during 2000/01 was also on OLL. A number of detailed earth science inventories were completed for new OLL- protected areas. In addition, many reconnaissance level earth science checksheets were prepared. These reports provided background information to the planning and regulation processes of the new properties.

Earth science ANSIs in the OMNR Midhurst District, as well as several others, were re-evaluated for condition, quality, and significance. An inventory of potential candidates for the Room to Grow initiative in the Lake Nipigon area was also completed.

Term and Condition #100 (T&C #100)

Growth and Yield Studies

The Forest Growth and Yield Program was established in 1991 to provide forest managers with better information on the growth and dynamics of Ontario's forests as influenced by site, forest structure, silvicultural treatments, and natural events. Beginning in 1992, a province-wide network of new PSPs was established over a range of forest sites and management conditions. Data collected from these PSPs provides information to forest managers and researchers on site and soil conditions, vegetation composition, tree growth, regeneration and mortality, and wildlife habitat conditions in Ontario's forests. To date approximately 1,100 PSPs have been established as part of this program. In 1999 efforts shifted from the establishment of PSPs to permanent growth plots (PGPs), which were easier and cheaper to establish and provided the basic information to meet forest industry needs. Although not as comprehensive, the PGPs also contributed to MNR's permanent plot network.

In 2000/01 the Growth and Yield Program focused primarily on three main areas: the establishment of new PGPs; the relocation, maintenance, and remeasurement of existing plots; and the continuation of forest modeling projects.

Establishment of New Plots

Efforts to install new single-day PGPs in co-operation with the forest industry were continued in 2000/01. Permanent growth plots are 400 square metre plots that are intended to track wood fibre growth and be responsive to forest management planning needs. They differ from PSPs in that each PGP measures only one-third the area of a PSP, they provide no mortality data, and they do not monitor non-timber attributes such as coarse woody debris or snags. A new field manual was developed to guide and standardize the establishment of PGPs. During 2000/01, 588 new PGPs were established.

Another project funded through the Forestry Research Partnership (Tembec Industries Inc., OMNR, Canadian Forest Service, and the Canadian Ecology Centre) resulted in the establishment of a network of plots to measure the impacts of the single tree selection harvesting of tolerant hardwood stands. These plots are permanent growth plots similar to other PGPs, except that they are 1000 square metres instead of the standard 400 square metres. A manual was developed to standardize the assessment of these plots. During 2000/01, 85 of these plots were established under pre-harvest conditions, and the first post-harvest assessment was completed on 22 plots.

Fifteen new PSPs were also established north of the AOU as part of the Northern Boreal Initiative.

Relocation, Maintenance, and Remeasurement of Existing Plots

An effort was made to maintain and remeasure as many provincial PSPs as fiscally possible. During 2000/01, 33 existing provincial PSPs were remeasured.

A concerted effort was also made to relocate historical plot systems and historical data. In most cases these historical PGPs were established by the forest industry in the 1950s and later abandoned. In other cases, this plot relocation work focused on relocating PGPs that were established by MNR years ago for other purposes. Relocating and remeasuring these old plot systems, along with recovering their corresponding data, provides growth and yield estimates not otherwise available from the current provincial PSP network. During 2000/01, 94 historical/abandoned PGPs were remeasured.

Modeling Projects

The Growth and Yield Program continued investigation and development of a growth and yield-modeling tool called “FVS$^{\text{ONTARIO}}$”. The Growth and Yield Program has joined with the Forestry Research Partnership to validate the model for forest types in the Boreal Forest region. Future work will involve calibration of this model for Great Lakes – St. Lawrence Forest types.

The Growth and Yield Program has also partnered with the forest industry to continue to develop new benchmark yield curves for the forest management planning process. These new yield curves use the most modern science and best available data to provide better information for standard forest units used in the provincial SFMM.

New Policies, Procedures, and Guidelines

Term and Condition #27(c) (T&C #27(c))

Clearcut Restrictions

Ontario’s *Forest Management Planning Manual* requires documentation for all planned clearcut areas by size class, and the rationale for any clearcut areas that exceed 260 hectares in size. These new reporting requirements began with the 1996/97 harvest year (but were reported in the following year in management unit annual reports). Provincial level reports were included for the first time with the 1998/1999 annual report.

Term and Condition #52(e) (T&C #52(e))

Water Crossing Removal Criteria Development

As previously reported a committee of technical experts from MNR, Ministry of the Environment and Energy (MOEE), and the forest industry developed a set of criteria to be used in decisions on the removal of water crossing structures for roads which are planned to be abandoned. The set of criteria, which addressed biological, engineering, water quality, and safety considerations, is outlined in an October 1997 report entitled, *Criteria for the Removal of Water Crossings of Abandoned Roads*.

Term and Condition #94(b) (T&C #94(b))

Environmental Guidelines

Ministry of Natural Resources was required by the EA Decision to produce an implementation manual referred to as the *Environmental Guideline for Timber Management Activities*. This guideline was to provide direction in relation to timber harvest layout, configuration, and clearcut sizes, and to address the protection of the physical environment in the course of forest harvest, renewal, and maintenance.

To meet this requirement, MNR developed an implementation manual that was released in two parts: 1) protection of the physical environment; and, 2) timber harvest layout, configuration, and clearcut sizes.

In response to the first part, the *Forest Management Guidelines for the Protection of the Physical Environment* was published in December 1997.

In response to the second part, MNR undertook background analysis of natural disturbance patterns. Also, as the result of a condition on the denial of a request for an individual EA on the 1999 Temagami Forest Management Plan (November 1999), MNR was required by MOEE to produce a first draft of the *Forest Management Guidelines for the Emulation of Fire Disturbance Pattern* by September 30, 2000. As with other guidelines, the Provincial Forest Technical Committee (a public advisory committee) provided advice during the development of this guideline. A multi-disciplinary writing team (with representatives from MNR, forest industry, and environmental organizations) was brought together in December 1999 by MNR to begin the task of writing the guidelines. A two-day workshop was held in April 2000 to solicit input from individuals representing MNR, the forest industry, Aboriginals, environmentalists, anglers and hunters, tourist operators, trappers, and prospectors. The first draft of the guideline was completed by the September 30, 2000 deadline, and posted on the Environmental Bill of Rights electronic registry for a 60-day public comment period. Approximately 1,500 comments were received. These were considered during the preparation of a second draft, along with the comments and suggestions offered during a second, similar workshop held in February 2001. Work continued on the development of a second draft for the remainder of the year.

Term and Condition #94(c) (T&C #94(c))

Guidelines for Pine Marten and Pileated Woodpecker Habitat

Ministry of Natural Resources was required by the EA Decision to develop two new guidelines: 1) *Forest Management Guidelines for the Provision of Marten Habitat;* and, 2) *Forest Management Guidelines for the Provision of Pileated Woodpecker Habitat.* As previously reported, both guidelines were completed in May 1996.

Term and Condition #98 (T&C #98)

Northern Ontario Wetlands Evaluation System

As previously reported in the 1995/96 annual report, the requirement to develop a Northern Ontario Wetlands Evaluation System has been delivered. The evaluation system was designed to allow a relative ranking of the importance of wetlands based on numerical scores assigned to biological, physical, and social attributes. Wetlands that are highly ranked are considered to be of provincial significance and are protected by wetlands policy. A system for evaluating wetlands in southern Ontario has been in place since 1984. This system was modified for use in northern Ontario. *The Ontario Wetland Evaluation System Northern Manual* was published in March 1993, with a revised manual released in May 1994.

In northern Ontario, MNR district office staff assess whether planned forest operations have the potential to impact a wetland and a decision is made whether to evaluate and rank the wetland. If the wetland is identified and evaluated as provincially significant, it is identified as a value within the forest management planning process and operations are planned in accordance with AOC planning requirements. The publication of the northern wetlands manual, and the subsequent release of explanatory technical notes in 1995 and 1996, improved the use of the evaluation system. These tools enable forest management planning teams to identify wetlands on the basis of their ecological features, values, and functions.

The Ontario Wetland Evaluation System: Northern Manual will be updated through work being conducted as part of the ELC Program (T&C #97), and will continue to be applied in forest management planning.

Term and Condition #103(a) (T&C #103(a))

Old Growth Conservation Strategies

The goal of the old growth conservation strategy is to ensure that old growth forest ecosystems are maintained in the landscapes of Ontario now and into the future.

As previously reported, MNR released a draft old growth policy proposal entitled *A Conservation Strategy for Old Growth Forest Ecosystems on Crown Lands in Ontario* for public review and comment in 1997. Further work on this policy proposal was postponed while efforts were diverted towards enhancing parks and protected areas through OLL.

In the winter of 1997/98, an MNR-wide team was established to develop definitions of old growth specific to Ontario forest conditions. Their findings are compiled into a draft technical report on old growth forest definitions that is expected to be released in Spring 2002. This draft report provides descriptions of old growth both for forest communities and for individual trees. These definitions are needed to support efforts to improve old growth forest inventories by providing a consistent and effective means for determining how much of our forests is comprised of old growth, and where the old growth is located. When finalized, these definitions will support Ontario's continuing efforts to identify old growth forests across the province.

Term and Condition #106 (T&C #106)

Roadless Wilderness Areas Policy

In May 1997, the MNR released Version 1.0 of a policy entitled *Ontario's Approach To Wilderness*, as required by Term and Condition #106. The Roadless Wilderness Areas Policy states that wilderness values will be accounted for under the auspices of land-use planning and resource management planning, such as MNR's Lands For Life planning process (now OLL), and under policy, legislation, and management programs developed in support of sustainable natural resource management in Ontario. The Roadless Wilderness Areas Policy states that MNR will engage in three initiatives and MNR is currently working in the following areas in support of these initiatives.

a. **To identify and establish outstanding wilderness parks and wilderness zones:**

   As stated in *Ontario's Living Legacy - Proposed Land Use Strategy*, the MNR has concluded that the park class targets have been achieved to the extent possible within the planning area. Consideration will continue to be given to the park class targets in planning for the portions of ecoregions and ecodistricts that extend beyond the Land Use Strategy planning area. A planning and consultation process will be developed to consider future suggestions for areas that may provide improved representation of natural heritage features. Any potential protected areas will be subject to broad public consultation through a formal planning process. Wilderness zones within park boundaries will be identified through parks management planning.

b. **To continue to work with partners and clients in order to protect wilderness values in southern Ontario:**

Work is ongoing in southern Ontario, and will be completed under the auspices of *Nature's Best, Parks and Protected Areas: A Framework and Action Plan*. For example, the Ontario Parks/Nature Conservancy of Canada Land Acquisition Program (formerly Legacy 2000), the MNR/Nature Conservancy of Canada Community Conservancy Program, and the Natural Areas Protection Program contribute to the protection of significant natural heritage values. Private land stewardship initiatives such as the Conservation Land Tax Incentive Program also contribute to the protection of significant values.

c. **To identify and define the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics, and to determine if there are any changes required to existing resource management and operational planning guidelines.**

An internal working group was formed by MNR to address the management of wilderness characteristics on the intervening landscapes, outside parks, and other types of protected areas. The working group, comprised of MNR staff, developed a draft discussion paper that examines the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics. This discussion paper is currently undergoing MNR review.

Term and Condition #110 (T&C #110)

District Land Use Guidelines

In July 1999, the MNR released the approved *Ontario's Living Legacy Land Use Strategy*. Wherever the Land Use Strategy and the 1983

District Land Use Guidelines address the same topics or areas, the *Ontario's Living Legacy Land Use Strategy* provides the current direction. The *District Land Use Guidelines* continue to provide some detailed land use and resource management direction, particularly for the General Use Areas land use designation, because the new strategy does not provide any specific direction for this designation.

In early 2001, MNR initiated a major project to consolidate the existing local land use direction for Crown lands from the Land Use Strategy, *District Land Use Guidelines*, and other special area plans. The objective is to provide a single, provincial, up-to-date and readily accessible source of land-use direction for Crown lands. The resulting Land Use Atlas will be available on the internet and in printed form. This compendium will replace existing local land-use direction, including the *District Land Use Guidelines*. Future changes to local land-use policies will occur through amendments to the Land Use Atlas. Appropriate advisory committees will be consulted as part of the amendment process.

New Forest Management Methods, Models, and Tools

Term and Condition #80 (T&C #80)

Long-Term Scientific Studies and Research

Tourism Effects Research

This study is designed to assess the effectiveness of the provincial *Timber Management Guidelines for the Protection of Tourism Values*, to determine the effects of forest management on tourism values, and to recommend improvements to the guidelines. Two major initiatives contributed to this study in 2000/01.

Work on the comparative economic resource-based tourism project began. This project takes a comparative approach to understand what role, if any, current forest management practices have on the revenues that operators generate from tourism establishments. Specifically, the project will produce predictive models that estimate the prices set at tourism establishments in relation to both site and setting characteristics.

Research emphasis on the comparative economic resource based tourism project during 2000/01 was largely spent on data collection. This data collection effort involved three related areas: identifying (and spatially referencing) active float plane, boat, and train accessible tourism facilities across Ontario; describing basic facility and establishment characteristics for these sites; and describing the setting and locational characteristics of these sites.

The identification of sites and collection of facility-related information was obtained from brochures, web-sites, and a mail survey that was conducted with tourism operators in late Fall 2000. The Natural Resources Values Information System (NRVIS) and Landsat data sources assisted with the collection of environmental setting information around these tourism sites.

Field staff also helped to verify the accuracy of the data bases by conducting site visits to tourism establishments and assessing the quality of spatial data on roads. The databases for the non-road accessible tourism products were completed and analysis began. The preparation of a report highlighting the survey data was also undertaken.

The second initiative of 2000/01 was the completion of analyses of data relating to shoreline aesthetics. A report summarizing the study was produced and two papers were being prepared. This project helps to explain the effect of disturbances on aesthetic values from off-shore vantage points.

Moose Guidelines Evaluation

This project is assessing the effectiveness of Ontario's *Timber Management Guidelines for the Provision of Moose Habitat*, and will assess the effects of current forest management practices on moose and other wildlife habitat, and recommend improvements to the guidelines. The following activities were carried out in 2000/01:

- A Moose Guidelines Research Workshop was held in Thunder Bay in November 2000 to examine the past activities and early results of the Moose Guidelines Evaluation Project , to identify present needs for analysis, and to set future directions for research.
- GPS collars deployed in February 2000 were recovered by recapture of 60 moose in February 2001.
- GPS base station files were collated and converted to appropriate formats for use with GPS collar data, for the period January 1995 to January 2001.
- Collection and spatial analysis of location data for 60 moose on the northwestern Ontario study site were continued; data recorded on GPS

collars were downloaded in late June and late September 2000, as well as at the time of collar recovery in February 2001; thus far, more than 1.2 million records have been downloaded from GPS collars.

- Participation in the development of biotelemetry data analysis protocols to address issues of data handling, collation, and analysis was continued, through the Chair in Biotelemetry at the University of Waterloo in agreement with Lotek Engineering Inc.
- Development of home range analysis software was continued. A revised version of the home range analysis software and manuals was produced in 1999/00. It was distributed through an independent website at The Wildlife Society annual conference in September 2000 and at a conference on *Tracking Animals with GPS* in Aberdeen, Scotland in March 2001.
- Studies of moose calving sites in the first Moose Guidelines Evaluation Project study area were completed. An M.Sc. thesis entitled *Calving site selection by GPS-collared moose in timber harvested areas of northwestern Ontario* was submitted to the Department of Biology at the University of Waterloo.
- An Honours B.Sc. thesis entitled *Characterization of moose (Alces alces) aquatic feeding areas* was submitted to the Department of Biology at Lakehead University.
- Studies of moose condition associated with habitat use in conjunction with the capture operation were continued: blood, hair, and fecal samples were again collected at the time of capture; body measurements and condition scores were recorded for each animal; ultrasound measurements of back fat were made on each moose; complete profiles of blood samples and mineral content of hair samples were again determined by the Animal Health Laboratory, University of Guelph; blood samples were forwarded to the Wildlife Forensic DNA Laboratory, Trent University, for genetic assessment; serum samples were analyzed for pregnancy-specific protein B by BioTracking, Moscow, Idaho; serum samples were also analyzed for insulin-like growth factor 1 by the Veterinary Teaching Hospital, Michigan State University; and, fecal samples were analyzed for corticosterones at the Center for Wildlife Conservation, Seattle, Washington.

Landscape Analysis of Wildlife Habitat

This research program is examining the effects of the *Timber Management Guidelines for the Provision of Moose Habitat*, and other forestry practices, on wildlife populations and habitat. The research was initially restricted to moose, but linked with T&C #107 is now also examining the effects of spatial patterns created by dispersed block cutting (moose guidelines) versus aggregated cutting (fire emulation guidelines).

The focus of the research is on characterizing the effects of logging on habitat patch size and configuration, and on developing predictive models of how changes in landscape configuration influence the quality of wildlife habitat. An important component of this research is comparing landscape patterns created through logging with those created by natural disturbance processes.

A multi-scale, habitat-modeling tool (LSL/CPAT) is being developed. This tool will facilitate spatially-explicit habitat modeling, and evaluation of other spatial objectives, as defined in forest management plans. This computer program, when completed and tested, could assist in implementing new directions in both the moose habitat guidelines and in the simulation of natural fire disturbance patterns.

Fieldwork to develop and test the spatial habitat models is now entering its second year. One objective of the study is to develop a spatial habitat model of breeding bird distribution, so there are heavy sampling demands. Two study sites have been established; the Cochrane and Iroquois Falls Forests (northeastern Ontario), and the Black Sturgeon and Spruce River Forests (northwestern Ontario). The CVX microphone system is being used to facilitate rapid collection of songbird biodiversity data. This project is in collaboration with the Wildlife Assessment Program, and receives in-kind support from Forest Fire Management Program and the Cochrane District.

Two other important collaborative studies have been initiated through the OLL program. A study of breeding birds in the Red Lake Forest is testing the assumption that the marten habitat guidelines will provide sufficient guidance to conserve forest songbirds. Another project is studying the effects of forest management on breeding songbirds in northern Ontario. Both of these studies will be using the CVX microphone system, and following similar data collection protocols, with the objective of sharing data among research programs.

Aquatic Effects Research

These long-term scientific studies are designed to assess the effectiveness of the provincial *Timber Management Guidelines for the Protection of Fish Habitat*, with an emphasis on the numerical measurement and modeling of land-use effects on aquatic ecosystems in northern Ontario. To date, aquatic effects research has been addressed through two integrated projects: the Coldwater Lakes Experimental Watersheds and the Comparative Aquatic Effects Program.

The Coldwater Lakes study was initiated northwest of Atikokan in 1990, to experimentally evaluate the effects of logging on lake ecosystems and to provide information about the effectiveness of shoreline reserves in preventing those effects. Five years of intensive pre-harvest monitoring (1991-1995) was followed by "worst case" experimental logging in 1996 (large cuts) and 1998 (secondary cuts), and four years of post-harvest monitoring (1997-2001). Minor to moderate aquatic impacts, similar to those caused by wildfire, have been observed in the three impacted lakes. These impacts are associated primarily with increased groundwater yield after the forest trees are removed. They are expressed as temporary increases in nitrogen, potassium, and dissolved organic carbon in lake water, which temporarily decreases water clarity and increases lake productivity.

The Comparative Aquatic Effects Program began in 1995 to measure the effects of timber management on aquatic ecosystems in Ontario's Boreal Forest, and to test the effectiveness of current timber management guidelines on preventing or minimizing these effects. To date, the program has focused on measuring timber-harvest effects on coldwater streams, since coldwater stream habitat is expected to be relatively sensitive to disturbance in the surrounding catchment. The program is investigating a number of areas including the key aquatic habitat variables to monitor the effects of timber harvest, the spatial scale of harvest impacts on aquatic ecosystems, the use of buffer strips to prevent sediment from moving overland and into water-ways, the effects of logging roads as barriers to fish migration, and the development of GIS-based tools to predict the location of small, unmapped streams that may serve as fish habitat.

These and other early results (many now published in primary scientific literature) suggest that the widespread use of shoreline reserves under the 1988 *Timber Management Guidelines for the Protection of Fish Habitat* and accompanying policy may be conservative in some respects if roads and water crossings are correctly planned and constructed. It is likely that some shoreline forest reserves may be safely harvested and regenerated without harm to aquatic habitat or water quality, as part of a landscape-scale forest disturbance plan. Collaborative MNR/industry/university monitoring to test the reliability of these results and their relevance to other areas of northern Ontario is now underway.

Term and Condition #101 (T&C #101)

Full-Tree Harvesting and Long-Term Site Productivity

This project was established in 1993 to provide a quantitative assessment of the effects of full-tree harvest and full-tree chipping on ecosystem processes, which ultimately influence site productivity for a range of black spruce-dominated ecosites. A total of nine core study sites were included in the experimental harvest component of this project, three sites harvested in 1994 and six sites in 1995. As another component of this study, data is also being collected from satellite sites to compare post-wildfire and post-harvest stand development patterns and ecosystem recovery at the ecosystem process level.

In 2000/01, field and laboratory work was continued on stands of different ages originating from wildfire, with over 20 sites ranging in age since disturbance from 4 - 110 years currently in the database. Overall project results have thus far led to the publication of three refereed journal papers, one book chapter, 11 technical reports, 15 theses (completed or in progress), and 64 workshop/conference presentations.

Term and Condition #102 (T&C #102)

Tending and Protection Improvement Programs

Ministry of Natural Resources has a number of ongoing projects related to pest management (insects and diseases) and vegetation management. Either on its own, or in partnership with other provinces and the private sector, MNR has funded a number of research projects in these two areas.

Pest Management

The CFS has been supported by MNR in the testing of neem, a botanical insecticide, for the control of insects affecting trees. This product is effective against insects, such as sawflies, which are not susceptible to the commonly-used product *Bacillus thuringiensis* (B.t.). In particular, MNR has supported studies looking at the aquatic impacts of neem, as well as the development of methodologies for its aerial application. The work is being done in partnership with the CFS, the County of Simcoe, and the provinces of New Brunswick and Newfoundland.

Other projects related to the pest management aspect of T&C #102 include:

- Support of a CFS study into the impacts, ecology, and control methods for pine false webworm (in partnership with the Department of National Defense and the County of Simcoe)
- Testing of the Advanced Integrated Multidimensional Modeling Software 2 (AIMMS 20) guidance system, which uses weather parameters from the forest canopy to adjust the location of aerial spray lines so as to minimize off-target drift and optimize the even deposit of the spray over the target stand (in partnership with the provinces of New Brunswick and Manitoba, and Forest Protection Limited)
- Support to the CFS for a study on introduced pine sawfly to develop a pheromone trapping system and a tree injection system for neem insecticide
- Testing of new B.t. products for controlling spruce budworm (in partnership with the CFS, and with funding from pesticide manufacturers)
- Ongoing trials to refine the pheromone for jack pine budworm for use as a detection method and possible control measure (in cooperation with Simon Fraser University, CFS, and New Brunswick Research Productivity Council)
- Support to the CFS in an on-going research project to develop early intervention strategies to reduce, or slow, the build up of spruce budworm populations
- Support to the University of Toronto to examine the role of natural enemies in the population dynamics of the European pine shoot beetle, a recently introduced insect
- Support to the CFS for research towards developing a hazard rating system for pine shoot beetle
- Support to the CFS to conduct field trials of new lures for trapping pine shoot beetle, in collaboration with the U.S. Forest Service

- Support to a University of Toronto study into the impacts of site preparation methods on the biodiversity of insect fauna, in collaboration with Domtar Inc. Inc.
- A study conducted by MNR into the impacts of pine false webworm on native pines
- Funding of a graduate student with the University of Toronto to assess bark beetle responses to the 1998 ice storm
- Funding to the CFS to develop field guides to the insects of Ontario conifers, and insects of Ontario hardwoods
- Conversion of the Spruce Budworm Decision Support System to Ontario forest management and forest resource inventory models, in collaboration with Tembec Industries Inc. Industries Inc. and the CFS
- Support to the University of New Brunswick to investigate the role of intensive forest management practices in sawfly outbreaks

Vegetation Management Alternatives

Since 1991, the focus of the Vegetation Management Alternatives Program (VMAP) has been to reduce dependence on herbicides in Ontario's forests by developing effective, safe, economically-viable alternatives, along with a better understanding of forest ecosystems. This has been achieved through basic and applied research, education, and field delivery, and includes the following accomplishments:

- Development of partnerships with Natural Resources Canada, academia (Lakehead University, University of Guelph, and Sault College), forest industries (Abitibi-Consolidated Inc., Bowater Pulp and Paper Canada Inc. Pulp and Paper Canada Inc., Clergue Forest Management Inc., Domtar Inc. Inc., Grant Forest Products Inc., Mackenzie Forest Products Inc., Tembec Industries Inc., Weyerhaeuser Canada Ltd., and Westwind Forest Stewardship Inc.), and non-government organizations (Upper Lakes Environmental Research Network [ULERN] and Forest Engineering Research of Canada [FERIC]) to ensure the continuation of established trials and the initiation of new trials
- Continued data collection, production of an interim report, and two field tours, with support from the Living Legacy Trust, on an environmental impact study established in 1995 near Parry Sound. The

study is examining the effects of the shelterwood system regeneration cut and four site preparation techniques on the components of white pine ecosystems, including: the overstory (health, seed production); white pine regeneration (establishment, ecophysiology, response to competition); and, ecosystem components (plant diversity and succession, carabid beetle and salamander populations, downed woody debris, nutrients)

- Reassessed five vegetation management treatment studies (Fallingsnow Ecosystem Project, Velpar-L, Raith and Nipigon Time x Rate, Nipigon Ground trial) and one plant competition study (Wharncliffe white pine)
- Provided manual vegetation management training to OMNR districts
- Submitted three journal papers to the Canadian Journal of Forest Research
- Drafted an information report on the effects of using sheep as a vegetation management control method in northeastern Ontario
- Continued to work on the *Guide to Opportunities* (a series of notes on vegetation management alternatives) and the *Plant Autecology Guide* (a series of notes on common forest plants of Ontario)
- Provided support to the CFS and Tembec Industries Inc. for a project designed to gain a better understanding of how and when to target vegetation management efforts to maximize white pine production and quality
- Provided support to the CFS and Tembec Industries Inc. for web-based site vegetation management publications (www.glfc.nrcan.gc/cfpm)

Term and Condition #104 (T&C #104)

Socio-Economic Analysis

As identified in the 1995/96 annual report, a Socio-Economic Impact Model (SEIM) has been developed by MNR to help in the determination of economic and social impacts of non-timber values and alternative forest management scenarios in forest management planning. Training on the model is ongoing with forest management planning teams, and the model is updated as required. The SEIM is continually updated as Statistics Canada revises the underlying input/output database, and newer Census of Population information becomes available. The most current version, SEIM2000, measures impacts using ecological regions, MNR's district boundaries, and results from the 1996 Census of Population.

Socioeconomic impact analysis is fully operational in the forest management planning process. During the development of each forest management plan, the advantages and disadvantages of management alternatives are assessed using SEIM.

A variety of research initiatives focusing on non-market valuation techniques and their applicability in Ontario has also been sponsored and assisted by MNR. These initiatives built upon a series of reports completed and published under MNR's Forest Values project. A diverse range of methods and issues have been examined, including costs of congestion for different elements within a recreational experience, net economic benefit from canoeing in Ontario, social values of wilderness areas, and economic value of big game hunting.

MNR has also undertaken internal investigations and has developed a methodology to determine non-timber values from existing administrative records. Results from the investigation of non-timber values have been used by the MNR to support land-use decisions, including support provided for the development of *Ontario's Living Legacy Land Use Strategy*.

Term and Condition #107 (T&C #107)

Biodiversity Assessment, Landscape Management, and Wildlife Habitat Supply Modeling

Landscape Ecology

The provincial Forest Landscape Ecology Program (FLEP) is assessing the effects of natural change and human activity on biodiversity and forest sustainability at the landscape level. The FLEP accomplished the following in 2000/01:

Boreal Forest Landscape Dynamics Simulator (BFOLDS)

The first version of BFOLDS (Windows NT/98/95), including complete integration with the Vegetation Transition Matrix, was completed. BFOLDS is a stochastic, spatially explicit, raster-based model for predicting natural boreal fire regimes at large scales, over long time periods (>200 years) on large areas (> 10,000 hectares). This model incorporates earlier work from ON-FIRE II, with many improvements in fire mechanics including state-of-the-art ignition, propagation, and fire behavior algorithms. Output of the model includes fire size distributions and spatial data layers of the future forest composition and age, and their bounds of natural variation. BFOLDS will assist in developing policy and in planning based on natural disturbance regime benchmarks.

Boreal Vegetation Transition Matrix (VTM)

The development of the first version of the VTM was completed. A time series of historic air photos (one set pre-fire, three sets post-fire) was collected for six boreal sites and an experimental design developed to use these data to calibrate the VTM. The VTM predicts forest cover succession, both in post-fire Boreal Forest landscapes and in the absence of catastrophic disturbances at large scales. This model is probabilistic and based on published knowledge of Boreal Forest succession, and accounts for climate and local site conditions. The VTM is fully integrated with the BFOLDS model, which is vital to guideline and policy development based on natural fire regimes.

Net Primary Productivity Assessment System (NPPAS)

The NPPAS was adapted to use new one kilometre AVHRR satellite data (versus eight kilometre data previously). It was developed to allow MNR users to generate surfaces of net primary productivity (NPP) at a sub-regional scale. Provincial and regional land use planners and forest managers can generate summary statistics for the forest management planning process, including the mean and range in NPP for the sub-region.

Spatial Assessment of Intensive Forest Management (IFM) on Tembec Industries Inc. forest land

Assessment of spatial feasibility for IFM was initiated within Tembec Industries Inc.'s licence areas. Feasibility will be assessed based on legislation and policy directions and multiple ecological factors. The result will be a coarse scale, spatial strategy that can guide integration of future studies of fine-scale economic, ecological, and social factors which explicitly define IFM sites. A workshop and a series of seminars were delivered to summarize and confirm methods and to present preliminary results.

Landscape Ecology Book: Ecology of a Managed Terrestrial Landscape, Patterns and Processes of Forest Landscapes in Ontario

A textbook on Ontario's forest landscape ecology was published through UBC Press. This book examines ecological patterns and processes in

Ontario through a series of case studies synthesizing current landscape ecological knowledge, identifying gaps, and providing future research direction. Integration of landscape ecological knowledge in forest management policy, including spatial patterns, ecological functions and processes, natural disturbance, and ecological response to disturbance, is also a major part of the book.

Comparing Spatio-temporal Patterns of Post-fire and Post-harvest Landscapes

A study was conducted to test possible differences in post-fire and post-harvest landscapes, using large-scale data from the 1950s to 1990s. The results of this project were published in a refereed journal paper and presented at a GIS conference.

Fire Mapping in Northern Boreal Ontario using AVHRR/NDVI

A method was developed to detect fires in the northern Boreal Forest using inexpensive satellite imagery (AVHRR) based on changes in a Normalized Difference Vegetation Index (NDVI) over the fire season. The method was tested by comparing detected fires from 1992, 1993, and 1995 imagery with mapped fires from this same period. This method represents a cost-effective means of mapping fires rapidly over very large areas, where manual detection is difficult and/or expensive. The results of this study were published in two refereed journal papers and presented at a GIS conference.

Landscape Ecological Analysis Package (LEAP II)

LEAP II, a software package used to quantify landscape patterns in the forest management planning process, was updated to improve functionality and to be compatible with new versions of ArcView/ArcInfo. Training for landscape pattern analysis concepts and LEAP II were delivered at two regional workshops. Training materials were also developed for regional analysts to use in future regional training workshops.

Landscape Ecology Searchable Literature Database

Updates continued to the searchable digital literature database developed from published studies in landscape ecology. This database provides users with an extensive set of current landscape ecology references that can easily be searched by author, keyword, subject, or title.

Wildlife Habitat Supply Analysis

Wildlife habitat supply modeling investigation and development work continues. A habitat supply model has been developed (OWHAM) which includes spatial models for moose, deer, pileated woodpeckers, and red-shouldered hawks for the Great Lakes-St. Lawrence Forest region and models for marten for both the Boreal East and the Great Lakes-St. Lawrence Forest regions. The OWHAM model is used to assist in the implementation of the pileated woodpecker and marten guidelines in the Great Lakes-St. Lawrence and Boreal East Forest regions. Work has also continued on Marten Analyst, to be used in the application of the marten habitat guidelines in the Boreal West Forest region. A combined habitat and population model for marten has been acquired and is being tested in support of the eventual evaluation and revision of the marten habitat guidelines.

A spatial allocation model (STANLEY) for use with SFMM is under development and evaluation. The nonspatial wildlife habitat relationships models (used in SFMM) for the Boreal East and Great Lakes-St. Lawrence Forest regions are being revised based on increased availability of empirical data.

Multiscale, spatially-explicit habitat models are being developed for moose, caribou, and forest songbirds, using the newly developed spatial modeling language (LSL). The LSL will also be used to assess natural disturbance patterns so that the landscape patterns created by forest harvesting will better match those of natural disturbance patterns. The research will define "spatial signatures" representing various types of natural disturbance.

Alternative forest habitat classifications to "Habitat Units" are being examined in the experimental studies. The alternatives include aggregates of Ecosites into vegetation groups (V-groups) and standardized Forest Units, classed by seral stage. This work is conducted under T&C #80 (Landscape Analysis of Wildlife Habitat). Study areas include the Cochrane Forest (forest birds) in northeastern Ontario, and the Black Sturgeon Forest (forest birds), Wabigoon Forest (moose), and Lac Seul Forest (caribou) in northwestern Ontario.

Term and Condition #108 (T&C #108)

Geographic Information Systems

Geographic Information Systems are designed to aid in the capture, storage, organization, analysis, and presentation of complex geographic data using computer systems. They are essential for the full development of modern resource management methods, models, and tools.

In 1994, the MNR selected a GIS software standard. This GIS has been installed in all MNR district and area offices. As well, systems are installed in regional offices, science units, research units, and systems development units. Systems, software, and technical training has been provided.

The MNR has proceeded to build applications using GIS and implemented these systems in appropriate offices. This includes MNR's corporate data repository, NRVIS, and the Ontario Land Information Warehouse. Geographic Information Systems are being used extensively to support forest management planning as well as corporate initiatives such as OLL. The MNR is currently migrating to the newest release of its GIS Software Standard (ArcGIS 8.1).

Strategic Forest Management Model

The SFMM model is used in Ontario to explore forest management strategies and options and to evaluate potential resource benefits, including available supplies of wood products, areas of potential wildlife habitat, and measures of forest diversity. This model is used by MNR to help model and project the development of Ontario's forests through time, in light of natural forest dynamics and the effects of human intervention. The SFMM model can be used to project the future forest condition, forest dynamics, available wood supply, potential wildlife habitat, and forest diversity through time horizons of 150 to 200 years.

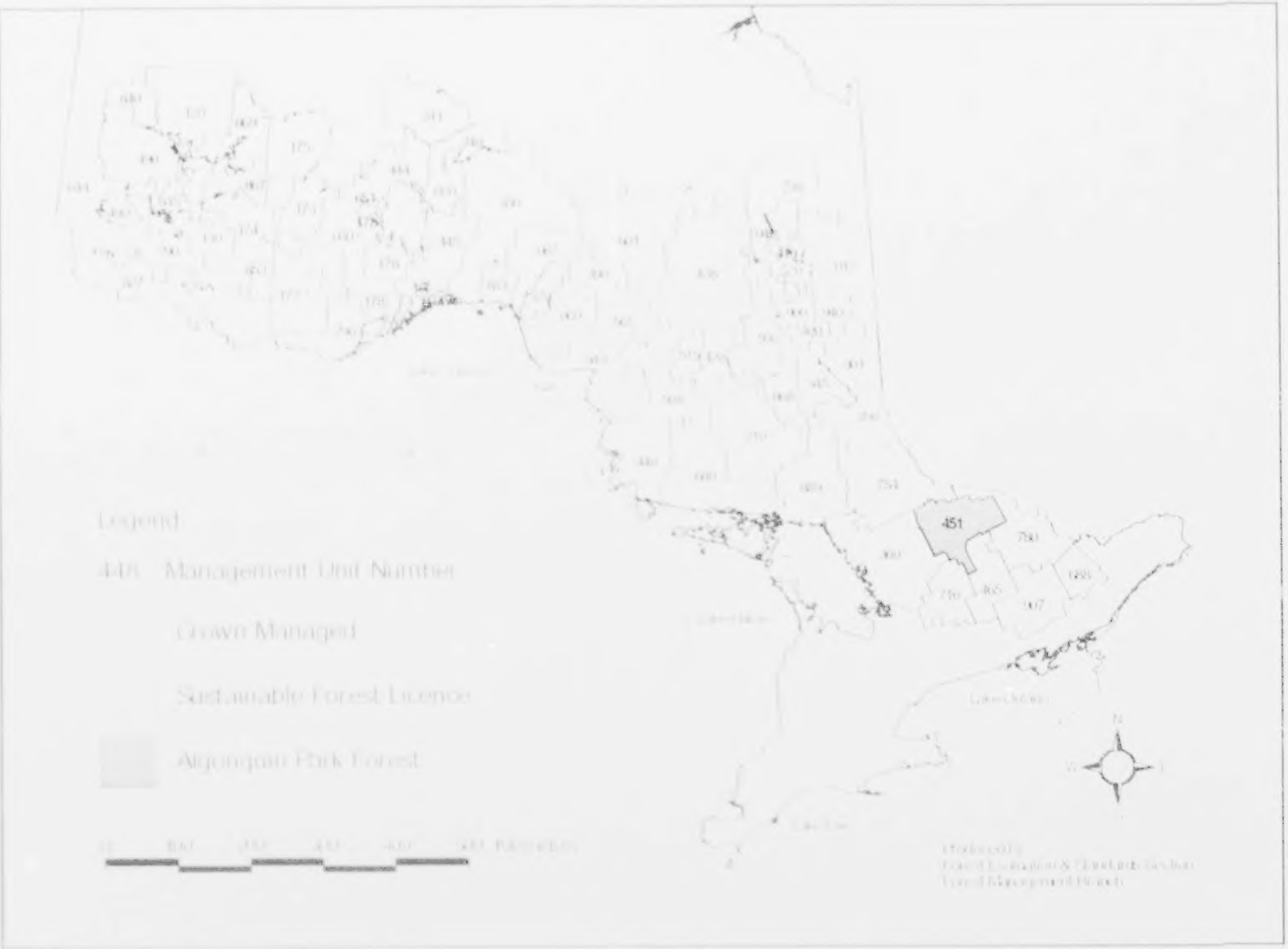
The SFMM model is used widely by MNR and other forest resource organizations, including consultants and forest products companies. It is the core tool used by forest management planning teams to develop "management alternatives, including the Available Harvest Area". These models are also used to support other areas of business such as land-use planning and regional wood supply strategies.

In 2000/01, MNR continued its ongoing development and transfer of SFMM, including the training of forest management planning teams and the further evolution of the model to version 2.0. This version provides incremental improvements to work started previously. This version is currently being tested and will be released in May of 2002.

Appendices

Appendix 1

Management Units in the Area of the Undertaking and Forest Management Planning Responsibility (Crown Lands) April 1, 2002



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Lake Superior
Lake Huron
Lake Ontario
Lake Erie
Legend
448 Management Unit Number
Crown Managed
Sustainable Forest Licence
Algonquin Park Forest
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500 Kilometres
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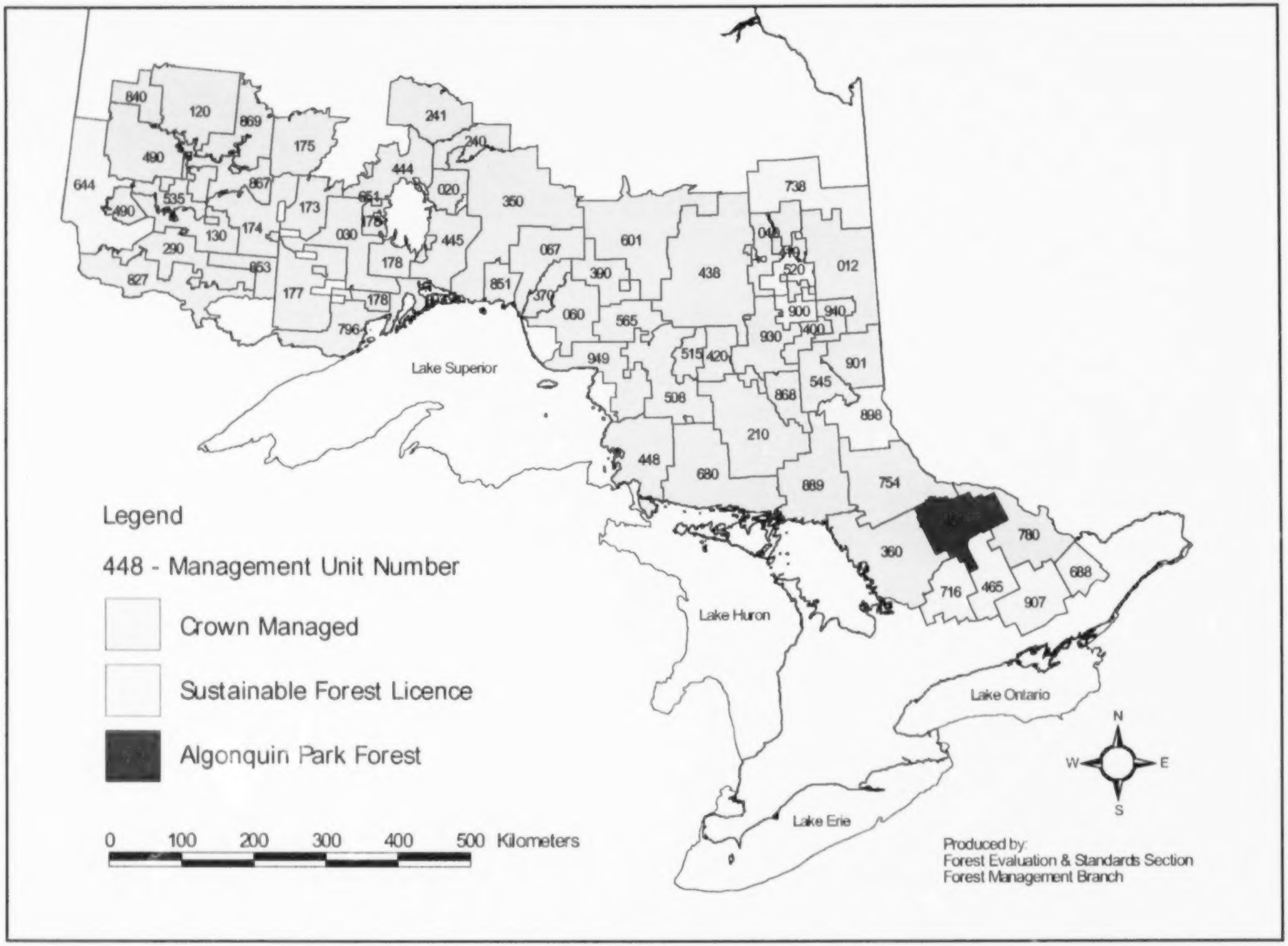
Produced by
Forest Evaluation & Standards Section
Forest Management Branch

Appendix 1
Management Units in the Area of the Undertaking and Forest Management Planning Responsibilities (Crown Lands) April 1, 2000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448 - Management Unit Number
Crown Managed
Sustainable Forest Licence
Algonquin Park Forest
0
100
200
300
400
500 Kilometers
Produced by:
Forest Evaluation & Standards Section
Forest Management Branch

Key to Management Units (April 1, 2000) (designated under the Crown Forest Sustainability Act, Section 7)

MU #	MU Name	Status	Region
448	Algoma Forest	SFL	NE
067	Big Pic Forest	SFL	NE
370	Black River Forest	SFL	NE
520	Cochrane	CR	NE
410	Driftwood Forest	SFL	NE
545	Elk Lake	SFL	NE
438	Gordon Cosens Forest	SFL	NE
601	Hearst Forest	SFL	NE
012	Iroquois Falls Forest	SFL	NE
515	J.E. Martel Forest	SFL	NE
565	Magpie Forest	SFL	NE
738	Moose River	CR	NE
390	Nagagami Forest	SFL	NE
754	Nipissing Forest	SFL	NE
680	Northshore Forest	SFL	NE
420	Pineland Forest	SFL	NE
930	Romeo Malette Forest	SFL	NE
868	Shiningtree Forest	SFL	NE
040	Smooth Rock Falls Forest	SFL	NE
210	Spanish Forest	SFL	NE
889	Sudbury Forest	SFL	NE
508	Superior Forest	SFL	NE
898	Temagami	CR	NE
901	Timiskaming	SFL	NE
900	Timmins	CR	NE
400	Timmins Forest	SFL	NE
940	Watabeag	SFL	NE
949	Wawa Forest	SFL	NE
060	White River Forest	SFL	NE
444	Armstrong Forest	SFL	NW
020	Auden Forest	SFL	NW
178	Black Sturgeon Forest	SFL	NW
173	Brightsand Forest	SFL	NW
175	Caribou Forest	SFL	NW
177	Dog River-Matawin Forest	SFL	NW
535	Dryden Forest	SFL	NW
174	English River Forest	SFL	NW
827	Fort Frances-Flanders Forest	SFL	NW
290	Highrock Forest	SFL	NW
350	Kenogami Forest	SFL	NW
644	Kenora	CR	NW
651	Kiashke River	CR	NW
869	Lac Seul Forest	SFL	NW
445	Lake Nipigon Forest	SFL	NW
796	Lakehead Forest	SFL	NW
240	Nakina North Forest	SFL	NW
241	Ogoki Forest	SFL	NW
851	Pic River Ojibway Forest	SFL	NW
840	Red Lake Forest	SFL	NW
853	Sapawe Forest	SFL	NW
867	Sioux Lookout Forest	SFL	NW
030	Spruce River Forest	SFL	NW
120	Trout Lake Forest	SFL	NW
130	Wabigoon Forest	SFL	NW
490	Whiskey Jack Forest	SFL	NW
451	Algonquin Park Forest	AFA	SC
465	Bancroft	CR	SC
360	French-Severn Forest	SFL	SC
688	Lanark	CR	SC
907	Mazinaw	CR	SC
716	Minden	CR	SC
780	Ottawa Valley Forest	SFL	SC
990	Southern Ontario (see Note)	CR	SC

Status	Forest Management Planning Responsibility
SFL	Sustainable Forest Licence
CR	Crown
AFA	Algonquin Forest Authority

Note: Southern Ontario (MU # 990) is south of the AOU.

Appendix 2
Total Provincial Area – by Satellite and Forest Resources Inventory Classifications – 2001
(all area in thousands of hectares)

	Total Provincial Area – Satellite Classes				Total Inventoried Area – FRI				Total – Planning Area – FRI			
Land Class	Crown	Parks	Other	Grand Total	Crown	Parks	Other	Grand Total	Crown	Parks	Other	Grand Total
Forested Land												
Productive Forest	44,401.4	4,962.8	6,371.8	55,736.0	30,010.2	4,109.9	6,071.2	40,191.3	25,582.5	3,941.4	4,159.1	33,683.0
Non-Productive Forested Land												
Wetland/Open Muskeg[1]	9,693.0	1,398.9	70.8	11,162.7	885.9	149.4	246.8	1,282.1	785.6	139.5	180.9	1,106.0
Treed Muskeg[2]	13,360.1	1,001.6	393.8	14,755.5	2,229.8	270.9	99.1	2,599.9	1,161.7	223.6	80.0	1,465.3
Tundra	25.7	33.0	0.0	58.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brush & Alder[3]		n/a	n/a	n/a	903.3	99.1	237.0	1,239.4	727.1	92.8	164.9	984.9
Rock	294.6	98.4	127.8	520.8	266.9	118.9	100.9	486.7	228.2	118.0	91.7	437.9
Sub-total	**23,373.3**	**2,531.9**	**592.4**	**26,497.7**	**4,286.0**	**638.3**	**683.8**	**5,608.1**	**2,902.8**	**573.9**	**517.4**	**3,994.1**
Non-Forested Land												
Developed Agricultural Land	8.3	3.5	4,454.0	4,465.8	14.7	1.1	3,925.8	3,941.7	2.8	0.3	418.2	421.4
Grass & Meadow	121.0	3.3	1,268.3	1,392.6	13.1	1.3	858.9	873.3	6.1	0.4	222.1	228.6
Unclassified Land	129.2	9.0	438.6	576.8	366.2	25.3	938.2	1,329.7	359.2	21.5	249.6	630.3
Sub-total	**258.4**	**15.8**	**6,161.0**	**6,435.2**	**394.0**	**27.7**	**5,722.8**	**6,144.6**	**368.1**	**22.3**	**889.9**	**1,280.3**
Water	8,199.7	1,476.8	359.3	10,035.9	6,755.3	924.4	21.6	7,701.3	5,433.4	888.1	20.7	6,342.3
Water (Great Lakes)	8,886.9	0.0	0.0	8,886.9	1,082.0	45.5	2.4	1,129.9	0.0	0.0	0.0	0.0
All Water	**17,086.6**	**1,476.8**	**359.3**	**18,922.8**	**7,837.3**	**969.9**	**24.0**	**8,831.3**	**5,433.4**	**888.1**	**20.7**	**6,342.3**
Grand Total	**85,119.8**	**8,987.3**	**13,484.5**	**107,591.7**	**42,527.6**	**5,745.8**	**12,501.9**	**60,775.3**	**34,286.8**	**5,425.7**	**5,587.2**	**45,299.7**

[1] - Includes "Wetland" satellite classs

[2] - Includes "Treed Bog & Fen" and "Swamp" satellite classes

[3] - Not available as satellite class

Appendix 3

Forest Management Plans Approved for Implementation in 2000 and Plans Scheduled for Approval and Implementation in 2001, 2002, and 2003

Plans Approved for Implementation in 2000

Management Unit Name	MU #	District	Remarks
Algoma Forest	448	Sault Ste. Marie	
Algonquin Park Forest	451	Algonquin Park	
Armstrong Forest	444	Thunder Bay	
Dog River-Matawin Forest	177	Thunder Bay	
English River Forest	174	Dryden	
Fort Frances-Flanders Forest	827	Fort Frances	amalgamation of Fort Frances Forest and Flanders Forest
Gordon Cosens Forest	438	Hearst	amalgamation of Gordon Cosens Forest and Kapuskasing
Iroquois Falls Forest	12	Cochrane	amalgamation of Iroquois Falls Forest and Iroquois Falls South
Kenogami Forest	350	Nipigon	formerly Longlac Forest, Nakina Forest and Geraldton
Northshore Forest	680	Sault Ste. Marie	amalgamation of Mississagi and Spanish River
Sapawe Forest	853	Fort Frances	
Smooth Rock Falls Forest	40	Cochrane	
Spanish Forest	210	Sudbury	amalgamation of Upper Spanish Forest and Lower Spanish Forest
Sudbury Forest	889	Sudbury	
Wawa Forest	949	Wawa	

Plans Scheduled for Approval and Implementation in 2001

Management Unit Name (current or proposed)	MU #	District	Remarks
Bancroft-Minden Forest	465/716	Bancroft	Bancroft and Minden to be amalgamated (new MU # is 220)
Black River Forest	370	Wawa	
Black Sturgeon Forest	178	Nipigon	
Dryden Forest	535	Dryden	early renewal by one year
Kenora	644	Kenora	
Lac Seul Forest	869/867	Sioux Lookout	Lac Seul Forest and Sioux Lookout Forest to be amalgamated (new MU # is 702)
Lake Nipigon Forest	445/020	Nipigon	Lake Nipigon Forest and Auden Forest to be amalgamated (new MU # is 260)
Mazinaw-Lanark Forest	907/688	Bancroft	Mazinaw and Lanark to be amalgamated (new MU # is 140)
Nagagami Forest	390	Wawa	early renewal by one year

continued next page

Management Unit Name (current or proposed)	MU #	District	Remarks
Ottawa Valley Forest	780	Pembroke	formerly Pembroke (MU # 780)
Pic River Ojibway Forest	851	Nipigon	formerly Steel River (MU # 851)
Pineland-Martel Forest	515/420	Chapleau	early renewal by one year, J. E. Martel Forest and Pineland Forest to be amalgamated (new MU # is 765)
Shiningtree Forest	868	Timmins	
Spruce River Forest	30	Thunder Bay	
Superior Forest	508	Chapleau	early renewal by one year
Timiskaming Forest	545/901/ 940	Kirkland Lake	Elk Lake, Timiskaming, and Watabeag to be amalgamated (new MU # is 610)
Timmins	900	Timmins	

Plans Scheduled for Approval and Implementation in 2002

Management Unit Name (current or proposed)	MU #	District	Remarks
Big Pic Forest	67	Wawa	
Caribou Forest	175	Sioux Lookout	
Crossroute Forest	290/827	Fort Frances	Highrock Forest and Fort Frances-Flanders Forest to be amalgamated (new MU # is 405)
Hearst Forest	601	Hearst	scheduled for early approval in 2001, implementation in 2002
Lakehead Forest	796	Thunder Bay	
Romeo Malette Forest	930	Timmins	scheduled for early approval in 2001, implementation in 2002

Plans Commencing Preparation in 2001 for Approval and Implementation in 2003

Management Unit Name (current or proposed)	MU #	District	Invitation to Participate – Tentative Date and Remarks
Cochrane-Moose River	520/738	Cochrane	February 2001, Cochrane (520) and Moose River (738) to be amalgamated
Nighthawk Forest	410/400/900	Timmins	February 2001, Driftwood Forest (410), Timmins Forest (400) and Timmins (900) to be amalgamated
Ogoki Forest	240/241	Nipigon	February 2001, Nakina North Forest (240) and Ogoki Forest (241) to be amalgamated
Red Lake Forest	840	Red Lake	January 2001
Wabigoon Forest	130	Dryden	January 2001
White River Forest	60	Wawa	March 2001

Appendix 4
Forest-dependent Communities in Ontario (ranked by percentage of forestry workers)

Census Subdivision	Type	1996 Population	Labour Force	Forestry Workers	% Forestry
Dubreuilville	Township	990	555	360	64.9%
White River	Township	1,025	555	300	54.1%
Terrace Bay	Township	2,325	1,275	605	47.5%
Carlow	Township	430	140	65	46.4%
Longlac	Town	2,075	1,235	570	46.2%
James	Township	485	235	105	44.7%
Ginoogaming First Nation 77	Reserve	220	55	20	36.4%
Dack	Township	480	200	70	35.0%
Iroquois Falls	Town	5,685	2,575	900	35.0%
Red Rock	Township	1,255	675	230	34.1%
Smooth Rock Falls	Town	1,985	975	330	33.8%
Dorion	Township	470	245	80	32.7%
Mattice-Val Cote	Township	935	370	120	32.4%
Val Rita-Harty	Township	1,115	495	150	30.3%
Brudenell and Lyndoch	Township	795	350	105	30.0%
Nipigon	Township	2,205	1,090	325	29.8%
Opasatika	Township	350	155	45	29.0%
Chapleau	Township	2,935	1,415	410	29.0%
Rainy Lake 18C	Reserve	65	35	10	28.6%
Espanola	Town	5,450	2,470	695	28.1%
Head, Clara and Maria	Township	295	125	35	28.0%
Baldwin	Township	695	330	90	27.3%
Constance Lake 92	Reserve	600	185	50	27.0%
Fauquier-Strickland	Township	690	260	70	26.9%
Kapuskasing	Town	10,030	4,655	1,200	25.8%
Sherwood, Jones and Burns	Township	2,140	860	220	25.6%
Ignace	Township	1,785	965	245	25.4%
Atikokan	Township	4,040	1,995	505	25.3%
Duck Lake 76B	Reserve	100	40	10	25.0%
Moonbeam	Township	1,330	605	150	24.8%
Mattawa	Town	2,280	870	215	24.7%
Nakina	Township	570	265	65	24.5%
Dryden	Town	6,685	3,475	840	24.2%
Barclay	Township	1,585	870	210	24.1%
Airy	Township	775	380	90	23.7%

continued next page

Census Subdivision	Type	1996 Population	Labour Force	Forestry Workers	% Forestry
Thessalon Township	Township	765	380	90	23.7%
Thessalon	Town	1,480	510	120	23.5%
Massey	Town	1,170	440	100	22.7%
Wunnumin 1	Reserve	455	155	35	22.6%
Raglan	Township	825	400	90	22.5%
Hearst	Town	6,015	2,995	660	22.0%
Wollaston	Township	720	300	65	21.7%
Iron Bridge	Village	780	330	70	21.2%
Nipissing, Unorganized, South Part	Unorganized	605	265	55	20.8%
Schreiber	Township	1,795	920	190	20.7%
Glackmeyer	Township	1,095	535	110	20.6%
Hagarty and Richards	Township	1,675	755	155	20.5%
Rainy River, Unorganized	Unorganized	1,525	890	180	20.2%
Hornepayne	Township	1,455	795	160	20.1%
Long Lake 58	Reserve	345	50	10	20.0%

Source: Statistics Canada 1996 Census

Appendix 5
Forest Renewal Charges ($ per cubic metre) for 2000/01

		Rates Charged by Tree Species or Groups of Species						
Region	**Management Unit**	**White and Red Pine Grade 1**	**White and Red Pine Grade 2**	**Hemlock and Cedar**	**Conifer**	**Poplar and White Birch**	**Hardwood Grade 1**	**Hardwood Grade 2**
Northwest	Armstrong Forest	11.00	11.00	2.00	2.00	0.50	8.00	1.50
	Auden Forest	11.00	11.00	4.50	4.50	0.50	8.00	1.50
	Black Sturgen Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Brightsand Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Caribou Forest	11.00	11.00	5.50	5.50	0.50	8.00	1.50
	Dog River Matawin Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Dryden	6.00	6.00	4.90	4.90	0.75	1.50	1.50
	English River Forest	11.00	11.00	5.50	5.50	0.50	8.00	1.50
	Fort Frances - Flanders Forest	11.00	11.00	0.00	5.50	0.50	8.00	1.50
	High Rock Forest	11.00	11.00	0.00	5.50	0.50	8.00	1.50
	Kenogami Forest	11.00	11.00	2.50	2.50	0.50	8.00	1.50
	Kenora	5.00	5.00	3.00	3.00	0.50	8.00	1.50
	Kiashke River	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Lac Seul Forest	11.00	11.00	6.50	6.50	0.50	8.00	1.50
	Lake Nipigon Forest	11.00	11.00	2.00	2.00	0.50	8.00	1.50
	Lakehead Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Nakina North Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Ogoki Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Pic River Ojibway	11.00	11.00	4.50	4.50	0.50	8.00	1.50
	Red Lake Forest	1.00	1.00	1.00	1.00	0.50	8.00	1.50
	Sapawe	6.00	6.00	2.00	4.00	0.50	8.00	1.50
	Sioux Lookout Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Spruce River Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Trout Lake Forest							
	Apr. 1, 2000 - Jan. 31/2001	11.00	11.00	4.50	4.50	0.70	8.00	1.50
	Feb. 1, 2001 - Mar. 31/2001	11.00	11.00	2.00	2.00	0.70	8.00	1.50
	Wabigoon Forest	11.00	11.00	2.00	2.00	0.70	8.00	1.50
	Whiskey Jack Forest	11.00	11.00	5.00	5.00	0.50	8.00	1.50
Northeast	Algoma Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Big Pic Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Black River Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Cochrane	11.00	11.00	5.50	5.50	0.50	8.00	1.50
	Driftwood Forest	11.00	11.00	4.96	4.96	0.75	8.00	1.50
	Elk Lake	11.00	11.00	4.00	4.00	0.33	8.00	1.50
	Gordon Cosens Forest	11.00	11.00	3.77	3.77	0.50	8.00	1.50

continued next page

		Rates Charged by Tree Species or Groups of Species						
Region	**Management Unit**	**White and Red Pine Grade 1**	**White and Red Pine Grade 2**	**Hemlock and Cedar**	**Conifer**	**Poplar and White Birch**	**Hardwood Grade 1**	**Hardwood Grade 2**
	Hearst Forest	11.00	11.00	3.00	3.00	0.40	8.00	1.50
	Iroquois Falls Forest	11.00	11.00	2.00	2.00	0.50	8.00	1.50
	J.E. Martel Forest	11.00	11.00	2.80	5.00	0.50	8.00	1.50
	Magpie Forest	11.00	11.00	5.50	5.50	0.50	8.00	1.50
	Moose River	11.00	11.00	3.00	3.00	0.50	8.00	1.50
	Nagagami Forest	11.00	11.00	6.41	6.41	0.75	8.00	1.50
	Nipissing Forest	11.00	6.00	6.00	6.00	0.50	8.00	1.50
	Northshore Forest	7.25	7.25	6.00	4.00	0.50	8.00	1.50
	Pineland Forest	11.00	11.00	6.00	6.00	0.60	8.00	1.50
	Romeo Mallette Forest	6.00	6.00	4.35	4.35	0.55	8.00	1.50
	Shiningtree	9.17	9.17	5.00	5.00	0.42	6.67	1.25
	Smooth Rock Falls	11.00	11.00	0.00	0.00	0.50	8.00	1.50
	Spanish Forest	6.00	6.00	1.00	1.00	0.50	8.00	1.50
	Sudbury Forest	11.00	6.00	6.00	6.00	0.50	8.00	1.50
	Superior Forest	11.00	11.00	4.50	5.40	0.50	8.00	1.50
	Temagami	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	Timiskaming	11.00	11.00	4.00	4.00	0.33	8.00	1.50
	Timmins	11.00	11.00	7.20	7.20	0.60	8.00	1.50
	Timmins Forest	11.00	11.00	7.10	7.10	0.75	8.00	1.50
	Watabeag	11.00	11.00	4.00	4.00	0.33	8.00	1.50
	Wawa Forest	11.00	11.00	6.00	6.00	0.50	8.00	1.50
	White River Forest	11.00	11.00	1.00	1.00	0.50	8.00	1.50
Southcentral	Algonquin Park Forest	4.75	4.75	0.10	0.10	0.10	4.75	0.10
	Bancroft	11.50	1.50	6.00	6.00	0.50	8.00	1.50
	French-Severn Forest	11.00	1.50	2.00	6.00	0.50	8.00	0.50
	Lanark	12.50	1.50	6.00	6.00	0.50	9.00	1.50
	Mazinaw	12.50	1.50	6.00	6.00	0.50	9.00	1.50
	Minden	11.50	1.50	6.00	6.00	0.50	8.00	1.50
	Ottawa Valley Forest	11.00	1.50	6.00	6.00	0.50	8.00	1.50
	Southern Ontario	12.50	1.50	6.00	6.00	1.50	8.00	1.50

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